

**Locally Defined Measures of Successful Forest Co-management:
A Case Study of Tl'azt'en Nation and the John Prince Research Forest**

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ABSTRACT

In Canada, First Nations rights and title to lands and resources have been recognized; however, reconciliation of land use conflicts has proven difficult. Co-management is emerging as a potential process for sharing authority between First Nations and others, though evaluative tools are required. This thesis builds on research by UNBC and Tl'azt'en Nation on adaptive forest co-management of the John Prince Research Forest. Through a case study, it presents a method for working with local First Nations to develop measures of co-management success.

The method engages 'local experts' through a modified Nominal Group Technique, with an iterative, participatory approach. Results include a set of locally-defined measures on cultural revitalization, characteristics of effective Tl'azt'en measures, and a method evaluation. The method successfully engaged participants in generating effective measures, and constructive participant feedback was received. Implementation of a monitoring program by the John Prince Research Forest is required prior to complete evaluation.

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Preface

This thesis is part of a larger collaborative research endeavor, “Partnering for Sustainable Resource Management”, led by the Tl'azt'en Nation-University of Northern British Columbia (UNBC) Community-University Research Alliance (CURA) the Social Sciences and Humanities Research Council award. The principal investigator of the CURA project is Dr. Gail Fondahl. The Improved Partnerships stream, of which my thesis is a part, was led by Dr. Erin Sherry (UNBC), Ms. Sue Grainger (John Prince Research Forest), and Ms. Beverly John (Tl'azt'en Nation).

I began working with Tl'azt'en Nation as a research assistant for UNBC, on the *Criteria and Indicators of Adaptive Forest Co-Management* research project in the fall of 2003. Here, I was first introduced to the Tl'azt'enne, to social science, and to qualitative research methods. As a long time resident of northern BC and as a professional forester, I feel that tools for cross-cultural collaboration are critical. Relationships between Aboriginal and non-Aboriginal people have been strained for too long, impeding not only land use activities, but also the well-being of Aboriginal communities. Thus, I hope to contribute to the development of methodological tools for First Nations and natural resource managers to work together.

List of Acronyms

BOD – Board of Directors

C&I – Criteria and Indicators

CCFM – Canadian Council of Forest Ministers

CIFOR – Center for International Forest Research

CRC – Chuzghun Resources Corporation

CSA – Canadian Standards Association

CURA – Community University Research Alliance

FSC – Forest Stewardship Council

ITTO – International Tropical Timber Organization

JPRF – John Prince Research Forest

LLI – Local Level Indicators

MCPFE – Ministerial Conference on the Protection of Forests in Europe

MP – Montreal Process

NAFA – National Aboriginal Forestry Association

PRA – Participatory Rural Appraisal

SFM – Sustainable Forest Management

SISDEL – Sistema de Desarrollo Local (Local Development System)

UNBC – University of Northern British Columbia

Acknowledgement

My thesis is the result of the guidance, work, support and encouragement of many people. A project such as this would be impossible without the collaboration of such a knowledgeable, hardworking team.

I am grateful for the willingness of my Tl'azt'en research participants to contribute their knowledge, expertise, time and energy to the study. I appreciate their patience and interest in the project, and their efforts to 'educate' me in the ways of their community. I wish also to acknowledge Tl'azt'en Nation Chief and Council and the Tl'azt'en Treaty Office for their support of this research.

I owe a debt of gratitude to Beverly John, the Tl'azt'en CURA Coordinator. Her coordination of my work in the community was invaluable. Her gentle guidance and local insights enabled me to succeed as a community based researcher. Her openness, readiness to laugh, perseverance, dedication, and generous spirit made this thesis a rich and transformative learning experience for me. As well, work by Stevie Anatole, my community research assistant, exceeded all my expectations - thank you Stevie.

The commitment of the John Prince Research Forest to engage in evaluation has created a rare opportunity for this type of work. Clearly, the support of the JPRF has been crucial to the success of this study. I am grateful to have participated in such a progressive organization. Further, insightful feedback from members of the CURA steering committee has improved my research.

I wish to express my warm and sincere thanks for the support of my supervisor, Dr. Gail Fondahl, over the last three years. I appreciate the opportunity to participate in the CURA as a funded graduate student and a research coordinator. Gail's commitment to the completion of my thesis, insightful suggestions, and faith in my abilities has been instrumental to my work.

The contributions of Dr. Erin Sherry have been exceptional. The consistency of her expertise, commitment, drive and compassion allowed me to achieve things that I did not realize I could. I greatly appreciate the guidance and expertise of Dr. Pamela Wright and Dr. Kathy Lewis throughout the study, and particularly their suggestions on the various drafts of this thesis. I have been fortunate to receive the mentorship of a committee of such incredible women. Pamela Perreault provided influential recommendations, and Michael Blackstock contributed thoughtful comments on an early thesis draft.

The comradery of my fellow graduate students in the NRES program was a great support. Rachael Clasby, in particular, helped me keep my sanity and organize my thinking. I am encouraged by the other CURA graduate students, and am grateful for their continued interest in this research.

I owe my loving thanks to my husband Orrin. He has given me tremendous support for this effort over the last three years. Researching and writing this thesis has challenged me in so many ways, and Orrin has been with me all the way. I appreciate his perceptive observations, steady encouragement and emotional support. His dedication and perseverance to his own work has been an inspiration.

1. Introduction

1.1 Context

Aboriginal people in British Columbia continue to assert their rights as stewards of their traditional territories. *Supreme Court of Canada* decisions such as *Delgamuukw* (1997)¹ and more recently *Haida* (2004)² have reaffirmed the federal and provincial governments' constitutional duty to meaningfully consult with First Nations before development proceeds on a landbase (Hiebert and Waatainen 2004). Although some First Nations have successfully established their rights through the treaty settlement process, this can be a lengthy and expensive undertaking; of those who have chosen this route, few have reached resolution (Notzke 1994; Curran 1999).³ In particular, the treaty land question in British Columbia has been largely left unresolved since it joined confederation in 1871 (Mills 1994).

At the international level, indigenous peoples' participation in natural resource management has been recognized as a critical component of sustainability (Brundtland 1987; Canadian Council of Forest Ministers 2003b). Forest managers, corporate leaders, and government officials recognize that managing for First Nations' values is a legal and moral obligation, as well as a means for creating a more stable economic environment (Kant and Zhang 2002; National Forest Strategy Coalition 2003; Hickey and Nelson 2005).⁴ Attempts to integrate Aboriginal values into existing forest management regimes have been inadequate and mechanisms which empower Aboriginal communities and give greater respect for Aboriginal

¹ *Delgamuukw v. British Columbia*, [1997] 3 S.C.R. 1010

² *Haida Nation v. British Columbia (Minister of Forests)*, 2004 SCC 73, [2004] 3 S.C.R. 511 Date: November 18, 2004

³ As of June 2007, eight of 57 First Nations in British Columbia are in the fifth stage of the treaty process (of six stages). Available at the BC Treaty website, <http://www.bctreaty.net/files/updates>.

⁴ See "The New Relationship" document, available at the BC Provincial Government website, http://www.gov.bc.ca/arr/down/new_relationship.pdf

knowledge, values and perspectives are needed (National Aboriginal Forestry Association 1997b; McGregor 2002; Treseder and Krogman 2002; Parsons and Prest 2003; Sherry, Karjala, and Dewhurst 2005).

Many First Nations and forest managers agree that collaboration is a positive approach towards sustainable forest management (National Aboriginal Forestry Association and the Institute on Governance 2000; British Columbia Treaty Commission 2003). The First Nations Summit, Union of BC Indian Chiefs, BC Assembly of First Nations and Premier of British Columbia have recently agreed on a “New Relationship”, which acknowledges the need for “integrated intergovernmental structures and policies to promote co-operation, including practical and workable arrangements for land and resource decision-making and sustainable development” (Government of British Columbia 2006, pg 3). The first action item in the New Relationship commits the Province and BC First Nations to “develop new institutions or structures to negotiate Government-to-Government Agreements for shared decision-making regarding land use planning, management, tenuring and resource revenue and benefit sharing” (Government of British Columbia 2006, pg 4).

Co-management is an emerging approach to resource management that intends to establish processes for sharing natural resource decision-making and benefits (Berkes *et al.* 1991), particularly between local users and larger state governments (Pinkerton 1989). First Nations have used co-management as a strategic approach for regaining partial control over their traditional territories and benefits from natural resources, either as an interim measure or as an alternative to litigation (Notzke 1994). Co-management shows promise as an institution where First Nations approaches to resource management can be put into practice, although not without potential costs (Notzke 1995; Kofinas 1998; Singleton 1998; Chambers 1999; Treseder and

Krogman 2000; Ross and Smith 2002; Sherry 2002; Shuter, Kant, and Smith 2005; Smith and Allen 2005). First Nations use co-management as a route to community-based economic development, capacity building, and empowerment of local resource users (Pinkerton 1989; Richardson and Green 1989). Policy-makers have created co-management arrangements in an attempt to resolve conflict through treaty settlements, crisis resolution mechanisms, and government or industry policy initiatives (Notzke 1994; Shuter, Kant, and Smith 2005).

As an evolving process, co-management requires adaptive management mechanisms for sustainability (Berkes and Folke 1998; Walters 2001; Folke *et al.* 2002; Sherry 2002; Olsson, Folke, and Berkes 2004). Adaptive management is an integral part of natural resource management from an Aboriginal perspective (Berkes 1999; Sherry and Myers 2002; Davidson-Hunt and Berkes 2003), and a scientific one (Holling 1978; Walters 2001). Monitoring is an essential component of an adaptive management strategy, as it provides the data with which to observe change over time (Walters 2001; Wright *et al.* 2002). Monitoring has been defined from a scientific perspective as “the periodic and systematic measurement and assessment of change...” (Wright *et al.* 2002, pg 285) and from an Aboriginal perspective as “watching, listening, learning and understanding about changes...” (Parlee and Lutsel K'e First Nation 1997, pg 7).

To date, co-management monitoring and evaluation have been initiated mainly through descriptive case study analysis of specific co-management regimes, sets of criteria developed from literature analysis, cost-benefit analyses, before-and-after comparisons, mapping environmental and social change, and the use of photos to stimulate evaluations (Pinkerton 1989; Kofinas 1998; Sherry 2002). While these techniques have produced informative results, authors report the need to delineate additional tools for determining the effectiveness of co-management

from the perspectives of local resource users and practitioners. Criteria and Indicators (C&I) have been recently applied in adaptive co-management settings to address these needs, but there are few published examples; especially lacking are C&I based on Aboriginal knowledge, values and institutions (Natcher and Hickey 2002b; Natcher and Hickey 2004, Sherry *et al.* 2005).

1.2 Criteria and Indicators of Adaptive Co-management

This thesis stems from a collaborative research project between Tl'azt'en Nation and the University of Northern British Columbia (UNBC); *Criteria and Indicators of Adaptive Co-management*. The project was led by Dr. Erin Sherry, Research Manager, UNBC; Ms. Susan Grainger Manager, John Prince Research Forest; and Ms. Beverly John, Tl'azt'en CURA Coordinator, John Prince Research Forest and member of Tl'azt'en Nation. This research uses the John Prince Research Forest (introduced in Chapter 3), as a case study to investigate participatory methods for developing local level criteria and indicators of adaptive co-management.

Initial research shows that the use of criteria and indicators has been well accepted in the community (Karjala and Dewhurst 2003; Karjala, Sherry, and Dewhurst 2003; Karjala, Sherry, and Dewhurst 2004; Sherry, Karjala, and Dewhurst 2005; Sherry *et al.* 2005). However, these works also showed that the indicators developed provide insufficient detail for full implementation. Discrete variables (termed here as *measures of success*) are needed to assess indicators, as are tested methods for their development (Sherry *et al.* 2004; Sherry *et al.* 2005).

1.3 Research Purpose and Objectives

The purpose of my research was to develop a method for generating locally-defined measures of co-management success, and to evaluate this method using a case study involving members of Tl'azt'en Nation and their co-managed land base, the John Prince Research Forest.

The objectives of this study were:

- a. to develop, implement and evaluate a process for identifying local Aboriginal measures of co-management success, specifically those related to cultural revitalization;
- b. to identify measures of co-management success from an Aboriginal perspective, and to compare these to similar studies; and,
- c. to describe characteristics of effective Aboriginal measures.

1.4 Rationale for Investigating Cultural Revitalization

Grounded theory analysis and framework analysis conducted by Sherry *et al.* (nd-a) identified over 600 critical local values relating to adaptive forest co-management of the John Prince Research Forest.⁵ It was important to limit the scope of this thesis to ensure manageability and produce useful results. Of the broad spectrum of values identified by Tl'azt'en, those relating to cultural revitalization were selected for investigation for four reasons. First, there was a demonstrated need for further investigation of social indicators and measures in relation to forest management, particularly in comparison to work on ecological and economic values (Beckley, Parkins, and Stedman 2002; Sherry and Fondahl 2004). Second, Tl'azt'enne placed a great deal of importance on the social and cultural functions of their forest. Third, many non-Tl'azt'en participants emphasized the need for Tl'azt'en input on this matter (Sherry *et al.* nd-a). Fourth, it

⁵ These critical local values were derived from 52 locally-identified experts from Tl'azt'en Nation, UNBC, and surrounding communities.

was critical to choose a theme in which Tl'azt'enne had the necessary expertise and interest, and with which they were confident, familiar, and comfortable. It should be noted that although cultural values with specific spatial elements (such as traditional knowledge) should be recognized in a study on cultural revitalization, they were excluded from this thesis because additional field-based methods were required for effective participatory measures development.

1.5 Thesis Overview

This thesis documents a process for identifying local Aboriginal measures of co-management success. To explore the existing methods for creating measures of success (particularly in Aboriginal communities), Chapter 2 provides a review of key literature relating to possible co-management evaluation methodologies. The case study is described in Chapter 3, where I provide background information on Tl'azt'en Nation, and their co-managed John Prince Research Forest. The method developed to generate local measures is presented in Chapter 4, where I also describe the field testing experience. The results and discussion are provided in three sections of Chapter 5 that correspond to my three research objectives: Tl'azt'en measures of co-management success, the characteristics of Tl'azt'en measures, and, the evaluation of the method. Chapter 6 concludes the thesis with some recommendations for implementing Tl'azt'en measures of cultural revitalization into co-management, and identification of future research needs.

1.6 Terminology

This thesis italicises Dakelh words and place names, but not the names of First Nations or their languages (e.g., Tl'azt'en, Dakelh). I capitalize the word 'Elder' as a demonstration of respect for their position and knowledge. It should also be noted that I use the terms First

Nations, Aboriginal, and indigenous interchangeably. 'Tl'azt'en Nation' refers to the community participating in this study, but the word Tl'azt'en is also used as an adjective (e.g., Tl'azt'en villages), and Tl'azt'enne means 'Tl'azt'en people', or members of Tl'azt'en Nation. 'Dakelh' is known as Carrier in English, and it refers to the linguistic group and language of the indigenous group, which includes Tl'azt'en Nation. Two Dakelh words, *keyoh* and *balhats* are used in this thesis. The traditional Dakelh governance system delineates family territories, known as *keyohs*. *Keyohs* are family (or clan) territories from which all resources necessary to life are obtained, and *keyoh* holders have responsibilities to be stewards for their *keyoh* (this is described further on pages 50-51). *Balhats* is known in English as the potlatch, and refers to the Dakelh governance system. 'Local Expert' is a term I use to describe the participants in the study, and to recognize the value of their contributions and expertise. The term 'Criteria and Indicators' (or C&I) refers to a framework of values (criteria) matched with variables for their measurement (indicators). In practice, criteria and indicators often require multiple levels of detail, such as sub-criteria, measures, and targets, and at times, indicators are used to describe values rather than measurement (for a further explanation, see page 12).

2. Literature Review

2.1 *Overview*

This literature review explores and integrates two major concepts that underpin the methods developed and tested in this project: Criteria and Indicators monitoring systems and program evaluation methodology. Criteria and Indicators (C&I) are used worldwide by governments, private industry, third-party certifiers, and local people for monitoring forest management and community sustainability. This chapter reviews the methods used to date in evaluating co-management, including top-down and bottom-up approaches. It also describes the evolution of C&I to give context to locally based measures development processes. This background is critical for determining an appropriate process for local C&I development, and for discussion and analysis of my results. Because participatory measures development processes are not well described in the C&I literature, concepts from the field of participatory program evaluation are introduced as a more advanced methodology.

2.2 *Co-management*

Co-management is emerging as an approach for First Nations, governments and private industry to share power, benefits and responsibility (Bickmore 2002). Co-management regimes differing in structure, legality, and cultural diversity are being established throughout Canada with a regional geographic focus or involving multi-species management (Berkes 1989; Morgan 1993; Kofinas 1998; Sherry 2002). Co-management generally is used to describe a variety of arrangements where natural resources are managed in partnership (Beckley 1998; Plummer and FitzGibbon 2004). Co-management can be an institutional arrangement for local people and

governments to share power and responsibility over natural resources (Osherenko 1988; Pinkerton 1989; Berkes, George, and Preston 1991; Berkes 1994). Others broaden the definition to include partnerships between local communities and other non-government partners such as industry, universities or non-profit organizations (Natcher 2000; Treseder and Krogman 2002; Sherry *et al.* 2005). Terms such as collaborative management (Borrini-Feyerabend 1996; Fisher 1995), cooperative management (Pinkerton 1989), coordinated resource management (Paulson 1998), shared resource management (Sherry 2002), and joint management (Kothari 1996; Sekher 2001; Sherry and Fondahl 2004) are often used to describe similar arrangements. For the purposes of this thesis, the term co-management refers to management partnerships with two or more partners, involving at least one Aboriginal partner at the local level, and at least one other partner from federal, provincial, or local governments, private industry, and/or non-profit organizations.

Osherenko (1988) was one of the first to provide a definition of co-management, describing it legalistically as a formal governance system:

A co-management regime is an institutional arrangement in which government agencies with jurisdiction over resources enter into an agreement covering specific geographic regions and make explicit 1) a system of rights and obligations for those interested in the resource, 2) a collection of rules and obligations for those interested in the resource, and 3) procedures for making collective decisions affecting the interests of government actors, and user organizations and individuals. (pg 13)

Pinkerton describes co-management as a process by which relationships are altered between resource actors, particularly local users and various levels of government (1989). Increasingly, co-management is being examined as a dynamic and adaptive process rather than simply an institutional arrangement (Sherry 2002; Olsson, Folke, and Berkes 2004; Carlsson and Berkes 2005).

Bickmore (2002) explains that as an emerging process, co-management requires evaluation for a number of reasons, for example:

1) to contribute to the ongoing evolution in co-management theory and practice; 2) to determine whether goals and objectives are being achieved; 3) to identify successful and unsuccessful approach to co-management; and 4) to determine if co-management institutions can remain effective. (pg 73)

2.3 Approaches to Evaluating Co-management

Researchers have assessed co-management effectiveness using sets of criteria determined through literature analysis, based on the attributes co-management should possess (e.g., Pinkerton 1989; Beckley and Korber 1997; Bickmore 2002). One of the earliest evaluations of co-management (Pinkerton 1989) was primarily retrospective and descriptive, but it appraised the extent of community involvement using a list of co-management functions, such as data gathering and analysis, harvesting decisions, allocation decisions, protection of resources from environmental damage, enforcement of practices and regulations, long-term planning and enhancement, and broad policy decision-making. Beckley and Korber (1997) used these same functions to assess co-management of the NorSask forest, a co-managed industrial forest tenure in northern Saskatchewan. In a study of co-management in protected areas, criteria used in previous co-management evaluations were adapted and supplemented by criteria for effective decision-making (Hawkes 1995; Hawkes 1996). Evaluation of co-management institutions resulting from the James Bay and Northern Quebec Agreement and the Inuvialuit Final Agreement used criteria for effective planning as assessment tools (Bickmore 2002).

More participatory forms of evaluation have also emerged. For example, evaluation of co-management effectiveness was compared between two caribou co-management boards based

on interviews with government and local resource users, as well as a review of biological data and government document analysis (Kruse *et al.* 1998). Participants were involved in the study design and verification of results. Sherry (2002) conducted a modified Delphi process to better understand participants' views on the essential elements of co-management processes using a bottom-up approach.

More recent evaluations have used criteria and indicators (C&I) as a framework for identifying local values according to those most involved in and affected by co-management (Natcher and Hickey 2002a, Kotwal and Chandurkar 2003b, 2003a; Karjala, Sherry, and Dewhurst 2004; Natcher and Hickey 2004; Sherry *et al.* 2005; Sherry, Karjala, and Dewhurst 2005). While criteria and indicators have not traditionally been used in the context of Aboriginal communities, the concept has been used on a preliminary basis to articulate local values in a format that is familiar to natural resource managers (Natcher and Hickey 2002a; Kotwal and Chandurkar 2003b, 2003a; Karjala, Sherry, and Dewhurst 2004; Natcher and Hickey 2004; Sherry *et al.* 2005; Sherry, Karjala, and Dewhurst 2005). A discussion of the wider applications of criteria and indicators gives perspective on the potential strengths, weaknesses and opportunities provided by using such a framework.

2.4 *Criteria and Indicators*

Criteria and Indicators (C&I) are the predominant monitoring mechanism in sustainable forest management (SFM) and are applied worldwide at a variety of scales. Emerging from the 1992 Earth Summit in Rio de Janeiro, C&I were applied internationally to monitor sustainability of ecosystems, including forests and the communities they support (UNCED 1993). Indicator-based systems are also used in monitoring community sustainability and well-being (Walter and

Wilkerson 1998; Beckley and Burkosky 1999; Hart 1999; Parkins, Stedman, and Varghese 2001), environmental and social impacts (Elias 1991; Volta and Servida 1992), and evaluating programs (Jackson 1998; Estrella *et al.* 2000; Rossi, Lipsey, and Freeman 2004).

2.4.1 Terminology

Although definitions vary, criteria are usually understood as the essential elements of a system; indicators are signs and signals used to evaluate an aspect of that criterion (Wright *et al.* 2002; Sherry and Fondahl 2004). In practice, several additional levels of organization are required for manageability of criteria, and often indicators must be broken down into further detail (Figure 2.1).

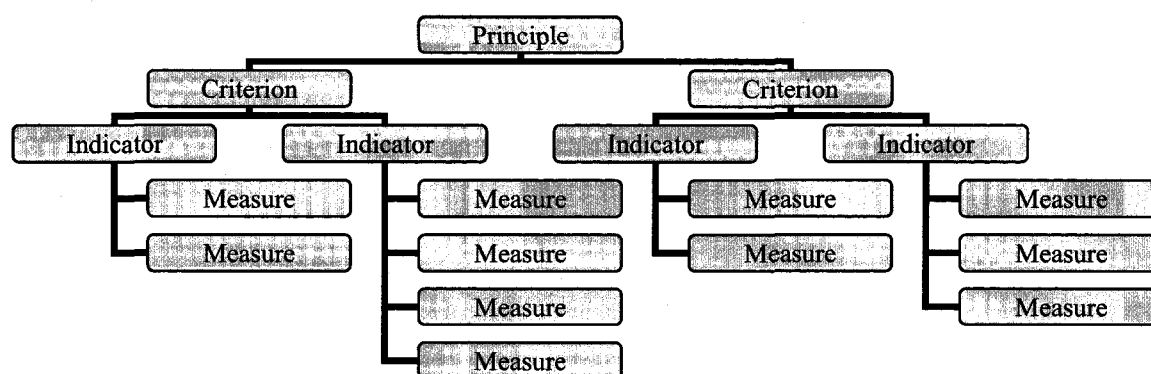


Figure 2.1. Example of a C&I hierarchical structure (Source: adapted from Wright *et al.* 2002, pg 81).

C&I frameworks break down indicators into several measures (Wright *et al.* 2002; Sherry *et al.* nd-a), which are also referred to in the literature as verifiers (CIFOR C&I Team 1999; FSC 2005) or local level indicators (von Mirbach 2000b). Differences in terminology have created confusion when comparing among frameworks (Sherry *et al.* 2005).

I use the term ‘measures’ to refer to the specific, ground level, measurable units that provide direction for evaluation of a clearly defined parameter. This relates to a commonly used definition:

Measures provide specific details or protocols that describe the way the indicator is measured in the field and include the source of information for the indicators; and the measurement methods including the form, scale, timing, and units of data that are gathered are specified. (Wright *et al.* 2002, pg 82)

Some projects use similar definitions for the term ‘indicators’ (c.f., Lammerts van Bueren and Blom 1997), particularly in the areas of community sustainability and social indicators research.

2.4.2 Origins of Sustainable Forest Management Criteria and Indicators

Monitoring of sustainable forest management was borne out of environmental concerns of the late 1980s and early 1990s. The Brundtland Report highlighted issues and questions related to “sustainable development” (Brundtland 1987); these issues were discussed on the international level at the 1992 Earth Summit in Rio de Janeiro. One product of the Summit was a plan of action named *Agenda 21*, which called for “scientifically sound criteria and guidelines for the management, conservation and sustainable development of all types of forests” (UNCED 1993: 11.22b). Agenda 21 made reference to Criteria and Indicators (C&I) developed by the International Tropical Timber Organization (ITTO) and recommended this framework as a model. The ITTO developed C&I in the early 1990s to help match conscientious timber consumers with timber producers who manage forests sustainably, and now assists tropical countries to monitor and report on SFM C&I at national and forest management unit levels (ITTO 2005).

With international interests setting the stage, regions of the world worked to establish criteria by forest type. European countries with temperate and boreal forests began developing a

framework through the Helsinki Process, which is now known as the Ministerial Conference on the Protection of Forests in Europe (MCPFE). Non-European countries with temperate and boreal forests chose to develop C&I separately through the Montreal Process.⁶ Progress is now being made through nine different processes, covering forested regions around the world with the participation of 149 countries, as shown in Figure 2.2 (Simula 2003). Countries within the regions are in various stages of progress in tailoring their regional C&I to better fit national interests (Simula 2003). For example, the Canadian Council of Forest Ministers (CCFM) has developed C&I for Canada to monitor and report on progress to sustainability (Canadian Criteria and Indicator Task Force 2003).

⁶ The Montréal Process is the Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests, with the objective to develop and implement internationally agreed upon criteria and indicators for sustainable management of temperate and boreal forests (Canadian Criteria and Indicator Task Force 2003).

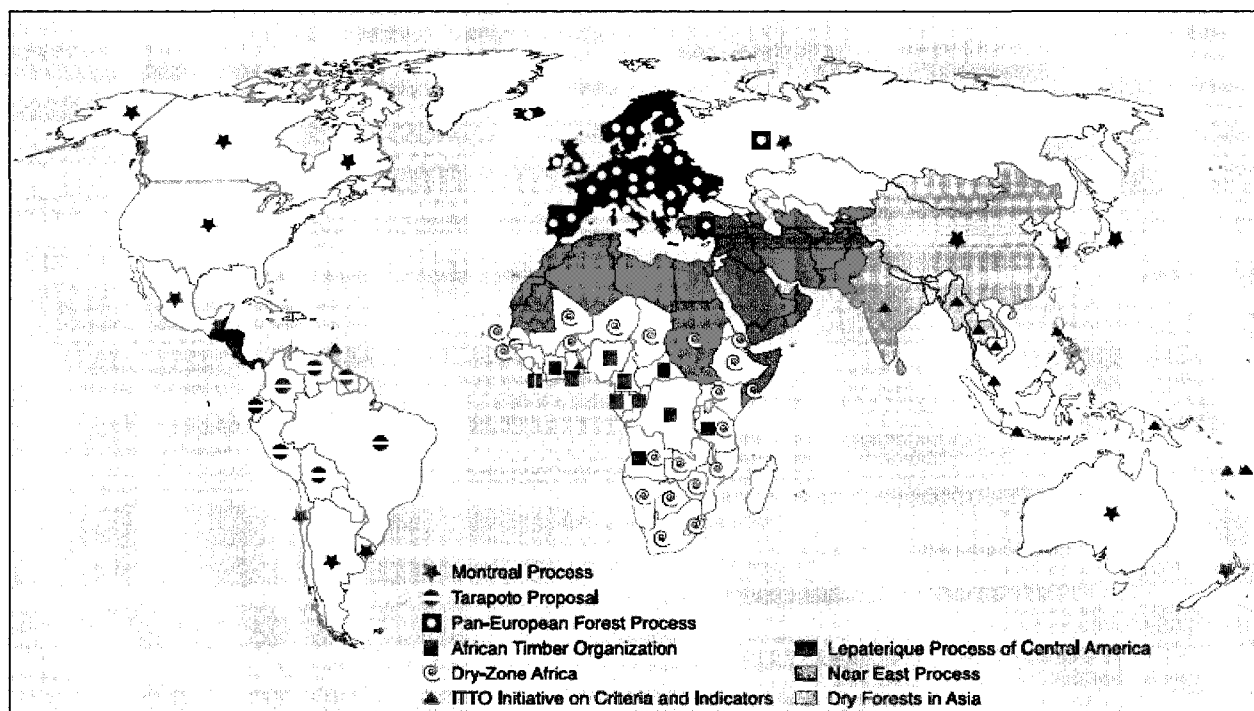


Figure 2.2. Participating countries in the various ongoing international processes on criteria and indicators for sustainable forest management (Source: Castaneda 2000, pg 37).

Although these multi-national C&I frameworks of forest sustainability tend to emphasize environmental aspects, they also recognize the importance of institutional support and social benefits. Table 2.1 shows the criteria developed by the ITTO, MCPFE, the Montreal Process, CCFM, and a synthesis of regional criteria developed by Simula (2003). It should be noted that these C&I are designed for national reporting on international commitments to sustainable forest management, and are intended to inform policy at these broad levels.

While governments created C&I to be reflective of their interests in reporting on national sustainability, non-governmental organizations have also utilized C&I to convey their interests in sustainable forest management. For example, some C&I are meant to target environmentally conscious consumers of forest products through “eco-certification”. The Forest Stewardship Council (FSC), an environmental organization, created a set of C&I to certify forest management

operations and their forest products as compliant with environmental stewardship standards (FSC 2005). The Canadian Standards Association (CSA) also takes a market-based approach, certifying forest management as sustainable according to C&I established by the CCFM (Johnson and Borgiel 2003). These C&I establish a minimum level of compliance. They are designed to inform potential consumers and are not intended for use in adaptive management.

These frameworks are generally referred to as *top-down* approaches to monitoring sustainability. Scientific technical experts have been involved in the processes of C&I development. In Canada, the Canadian Council of Forest Ministers is informed by six Technical Working Groups (one for each criterion) representing governments (federal, provincial and territorial), academia, national Aboriginal groups, industry, and non-governmental organizations (Bridge *et al.* 2005).

Table 2.1. Criteria listed for selected C&I frameworks for reporting on sustainable forest management (ITTO 2005; MCPFE 2002; Canadian Forest Service 1999; CCFM 2003a) and a synthesis of multiple frameworks (Simula 2003).

Theme	ITTO	MCPFE	MP	CCFM	Synthesis
Environmental	Extent and condition of forests	Maintenance and appropriate enhancement of forest resources and their contribution to global carbon cycles	Conservation of biological diversity	Conservation of biological diversity	Extent of forest resources
	Forest ecosystem health	Maintenance and forest ecosystem health and vitality	Maintenance of productive capacity of forest ecosystems	Maintenance and enhancement of forest ecosystem condition and function	Forest Health and Vitality
	Forest production	Maintenance and encouragement of productive functions of forests (Wood and non-wood)	Maintenance of forest ecosystem health and vitality	Conservation of soil and water resources	Productive functions of forests
	Biological diversity	Maintenance, conservation and appropriate enhancement of biological diversity in forest ecosystems	Conservation and maintenance of soil and water resources	Forest ecosystem contributions to global ecological cycles	Biological diversity
	Soil and water protection	Maintenance and appropriate enhancement of protective functions in forest management (notably soil and water)	Maintenance of forest contribution to global carbon cycles	N/A	Protective functions of forests
Institutional Support	Enabling conditions for sustainable forest management	Overall policies, institutions and instruments for sustainable forest management	Legal, institutional and economic framework for forest conservation and sustainable management	Accepting society's responsibility for sustainable development	Policy and institutional framework
Social	Economic, social and cultural aspects	Maintenance of other socioeconomic functions and conditions	Maintenance and enhancement of long-term multiple socio-economic benefits to the needs of societies	Multiple benefits of forests to society	Socio-economic benefits and needs

The main approach for including local people in C&I development has been to involve them in creating measures for indicators established at higher levels. The CCFM has undertaken a series of projects on measures (they use the term Local Level Indicators) through the Canadian Model Forest Network (von Mirbach 2000b). However, this approach is limited in its ability to meaningfully involve local people as it does not necessarily integrate local values in forest management (Sherry *et al.* 2005; NAFA 2006). Rather, it seeks local perspectives on assessing externally-derived measures which may or may not be of local interest.

While C&I frameworks have similarities, they are designed for distinct purposes. For this reason, criteria, indicators and measures cannot be readily adopted across scales and purposes (Wright *et al.* 2002; Sherry *et al.* 2005). It should be noted that government-led C&I in Canada are designed primarily for public and international reporting, and for providing information for national policy-making, not for operational forest planning. Likewise, C&I for certification are designed to market the ‘environmentally-friendly’ aspects of certified forests, as defined by certification bodies with differing interests.⁷ Thus, other C&I frameworks do not necessarily represent local level values.

2.4.3 Aboriginal Reactions to Top-Down Sustainable Forest Management

C&I in Canada

While various First Nations groups in Canada have shown interest in C&I as a concept, the C&I set out by external experts, especially at a national scale, have been met with concern and resistance. For instance, the National Aboriginal Forestry Association (NAFA) published

⁷ For example, the Sustainable Forestry Initiative is funded by the American Forest & Paper Association, and sets highly attainable standards [<http://www.afandpa.org>]. In contrast, high standards are set by the Forest Stewardship Council which is funded by the World Wildlife Fund, a well known environmental advocate [<http://www.fsc.org>].

“An Aboriginal Criterion for Sustainable Forest Management” including several related indicators, as it felt Aboriginal interests were not sufficiently represented by the CCFM’s framework (NAFA 1997a).⁸ NAFA is now working towards developing indicators for ‘Rights and Participation of Aboriginal Peoples’ (NAFA 2006). The Canadian Council of Forest Ministers’ C&I are also inconsistent with the values and perspectives of First Nations at the local level. The Waswanipi Cree of the Waswanipi Cree Model Forest rejected a proposal to implement measures of CCFM indicators, and opted instead to work with locally based criteria (von Mirbach 2000b; Robertson 2002; Waswanipi Cree Model Forest 2004). Aboriginal peoples in Canada also support and have participated in the development of Forest Stewardship Council C&I (Peachey 2002). First Nations in British Columbia are calling for the development of Aboriginal C&I and associated processes to be used to advocate for First Nations’ forest values (BC First Nations Leadership Council 2005). For example, the Nuu-Chah-Nulth of Vancouver Island opted to develop their own C&I through a monitoring partnership between Nuu-Chah-Nulth and scientific experts, rather than use top-down C&I (Cortex Consultants Inc. 1995; Hoberg and Morawski 1997). Work with First Nations of Prince Albert, Saskatchewan has shown that local people insist on developing their own measures, rather than evaluating those developed by others (Northern Lights Heritage Services and L. Larcombe Archaeological Consulting 1999).

2.4.4 Bottom-Up C&I for Adaptive Management

Local applications of C&I are internally focused, and typically part of an adaptive management program (Wright *et al.* 2002). Adaptive management is a cycle of continuous,

⁸ NAFA refused to sign on to the CCFM C&I until spring 2006, when NAFA became designated as the “Champion of Theme 3 – Rights and Participation of Aboriginal Peoples”.

active learning about an ecosystem (Figure 2.3), necessitated by the inherent complexity of ecological, social and economic systems (Walters and Holling 1990; Karjala 2001; Wright *et al.* 2002). The purpose of adaptive management is to continually improve management policies and practices based on continually updated information about the system being managed (Walters 2001; Wright *et al.* 2002).

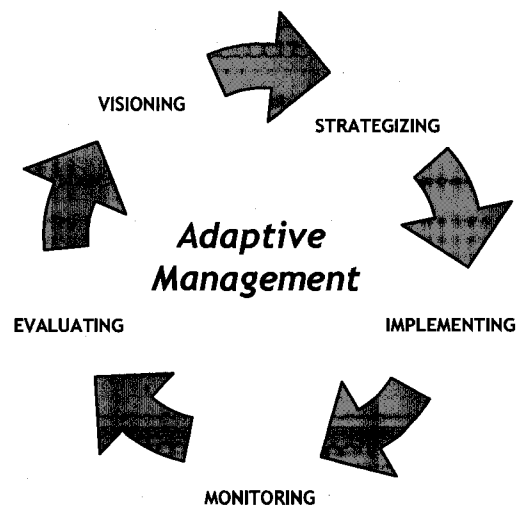


Figure 2.3. The adaptive management cycle (Source: adapted from Karjala, Sherry, and Dewhurst 2003, pg 21).

Local level C&I involving indigenous peoples have been implemented to improve forest management in small-scale projects around the world. The most major undertaking has been a program led by the Centre for International Forest Research (CIFOR). In recognition of the distinctness and variability of local values, CIFOR has developed a generic template to provide a tool for local communities to select measures from a large database. The bulk of this work occurs in tropical countries, where indigenous people use forests primarily for non-timber purposes, as opposed to industrial timber harvesting (e.g., Pierce Colfer, Prabhu, and Wollenberg 1995; Prabhu *et al.* 1996; Prabhu, Colfer, and Shepard 1998; Prabhu 1999; Mendoza and Prabhu 2000, 2003; Pokorny *et al.* 2004; Mendoza and Prabhu 2005). CIFOR's research has also been

implemented in North America, although Aboriginal people were not substantially involved (Woodley *et al.* 1999; Wright *et al.* 2002). A profile of six independent, bottom-up C&I projects assessing the effectiveness of forest co-management with Aboriginal people is provided in the following sections, focusing on a description of the C&I development processes undertaken as well as the C&I themselves.

2.4.4.1 C&I as a Tool for Strategic Planning, Tl'azt'en Nation, Northern BC

The University of Northern BC and Tl'azt'en Nation have a significant history of collaborating on projects relating to C&I of for the sustainable management of the John Prince Research Forest since 1999. The use of C&I began in 1999 with the project entitled *Evaluation of the "Echo" System and Scenario Planning for Sustainable Forest Management*. This program included development of a forest estate model (called "Lurch") to conduct scenario planning on the John Prince Research Forest. This model utilized forest management indicators, and allowed for the integration of new community-defined indicators. Forest planning scenarios produced by this model were presented to Tl'azt'enne, and the model and plans were adapted based on their feedback (Karjala 2001; Kessler *et al.* 2001). Development of local C&I was first attempted through the project *Integrating Aboriginal Values Into Strategic-Level Forest Planning on the John Prince Research Forest* (Karjala 2001), leading into the more refined *Aboriginal Forest Planning Process* (Karjala, Sherry, and Dewhurst 2003; Sherry, Karjala, and Dewhurst 2005). This community-based planning process consists of archival analysis by trained community members (e.g., Traditional Use Studies, extant interview transcripts, secondary sources) to create preliminary C&I which were then reviewed and revised with a community advisory group,

supplemented by participatory research, and then finally verified by a wider group of community volunteers (Karjala, Sherry, and Dewhurst 2003). This work led to the present study.

2.4.4.2 C&I for Monitoring Co-management Success, Little Red River Cree, Northern Alberta

Research by Natcher and Hickey (2002a) defined key co-management values from the Little Red River Cree and Tall Cree perspectives with regard to their partnership with an industrial forest company, and offered preliminary indicators of success. The extent of community involvement in the specific measures development process is not clear. Samples of local environmental values, indicators and actions were recommended. The authors are currently undertaking similar research with the Kaska First Nation, but do not plan to publish further on their work with the Little Red River Cree and Tall Cree.⁹

2.4.4.3 Monitoring Program of the Scientific Panel, Nuu-Chah-Nulth, Vancouver Island, British Columbia

The Nuu-Chah-Nulth of Clayoquot Sound along with non-Aboriginal residents, BC developed an environmental monitoring program based on locally-developed C&I for use in their co-management agreement (Wright 1999). Methods involved a workshop where participants reviewed a list of C&I from the literature, prioritized those they selected, and identified gaps in the list. Values related to cultural revitalization were not investigated.

⁹ Personal communication, David Natcher, March 24, 2006.

2.4.4.4 Cultural Indicators for the Wet Tropics, Girramay, North Eastern Australia

In the Australian Wet Tropics World Heritage Area of Northern Queensland, the Girramay people created C&I to set out Aboriginal values of protected areas management, including measures. Criteria and indicators were developed using a series of focus groups that were open to all community members. Results include measures relating to indigenous rights and access to traditional territory, stewardship opportunities, the use of indigenous language in resource management, and acknowledgement of colonial history (Smyth and Beeron 2001; Smyth 2002).

2.4.4.5 Indigenous Measures of Sustainability, Jhabua, India

In 1990, the Indian government legislated Joint Forest Management (JFM) between government and local forest users (Kotwal and Chandurkar 2003b). Workshops were held in India's Jhabua Forest Division to develop local level C&I, based on a synthesis of bottom-up and top-down approaches (Kotwal and Chandurkar 2003a, 2003b). The process engaged existing JFM committee members (n=74), field foresters (n=5); and one civil society representative in two phases (Kotwal and Chandurkar 2003b). The first phase involved sensitisation to the SFM and C&I concepts, drafting of measures based on regional C&I (from the Bhopal-India Process), and field verification. The second phase focused on institutionalizing monitoring of the measures. Results of the process were not reported (Kotwal and Chandurkar 2003a, b).

2.4.4.6 Improving Forest Management Planning through Enhancing Cree Participation, Waswanipi Cree, Northern Ontario

The Waswanipi Cree are working to develop measures for C&I based on objectives set out in their treaty settlement. Throughout the planning cycle, the Tallymen (Crees traditionally responsible for the area) have been negotiating with the Quebec government and forestry company representatives (Pelletier 2002). Through these negotiations, the Crees have become involved in monitoring activities, and now seek to influence the design of the monitoring program (Pelletier 2002). While the Waswanipi Model Forest has expressed interest in developing a local level C&I framework through the “Ndoho Istchee/Cree Criteria” project (Natural Resources Canada 2002; Pelletier 2002), no published information could be found on this project to date.

2.4.4.7 Overview of Bottom-up C&I Examples

These six examples illustrate the nature and extent of research required to develop bottom-up C&I. A range of possibilities exist in terms of the extent of community involvement, the methods employed, and the diversity of management contexts. While two examples (Tl’azt’en Nation and Little Red River Cree) were available through academic journals, the four remaining examples were identified through conference proceedings or unpublished reports accessed via the internet or through personal communication with researchers. While examples exist in practice, critical documentation and evaluation of the methods is generally lacking.

2.5 Innovative Methodologies: Bottom-up Approaches to Measures Development

2.5.1 Participatory Evaluation

Sustainable forest management C&I have evolved from the need to evaluate sustainability at national levels, with a mandate for developing science-based policy. Thus, top-down approaches involving academics and professionals (e.g., ecologists, sociologists, economists, foresters) have dominated the development of SFM C&I and associated measures. Projects seeking involvement of ‘local experts’ have used participatory approaches; however, methods are in early stages of development. Much insight into the elaboration of bottom-up approaches to C&I development can be gained from the field of participatory program evaluation, where methodologies have emerged from monitoring at smaller scales (i.e., programs and organizations).

Program evaluation is “the systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about the program, improve program effectiveness, and/or inform decisions about future programming” (Patton 2002, pg 10).¹⁰ In the science and profession of evaluation, much progress has been made in developing rigorous participatory processes. However, I was unable to identify any published evidence of application of this work to SFM C&I development. Participatory monitoring and evaluation is being refined in fields such as international development (Estrella and Gaventa 1998; Davis-Case 1989; Estrella *et al.* 2000), education (Patton 2002; Fetterman and Wandersman 2005), social

¹⁰ The Canadian Evaluation Society provides background information on the practice of evaluation in Canada, and there are a number of peer-reviewed journals on this topic. Examples include: *the Canadian Journal of Program Evaluation*; *the Journal of MultiDisciplinary Evaluation*; *Evaluation: The International Journal of Theory, Research and Practice*; *Performance Evaluation: An International Journal*; *Evaluation Review*; and *the American Journal of Evaluation*.

More information, see <http://www.evaluationcanada.ca>.

work (Secret, Jordan, and Ford 1999), community development (Weaver 1999), and health (Lantz *et al.* 2001; Hausman *et al.* 2005). These areas have much in common with co-management evaluation; they provide methodologies at the level of an organization or program working with indigenous communities in cross-cultural contexts, and dealing with issues of community well-being.

Program evaluation methodology underwent a transformation in the late 1980s with Guba and Lincoln's "Fourth Generation Evaluation" (1989), which incorporates the views and values of stakeholders in the evaluation process (Alkin 2004). Previous forms of evaluation favored managers; evaluation could be disempowering, unfair, and/or disenfranchising for stakeholders, and tended to be biased toward the client (Guba and Lincoln 1989). Since this publication, several types of bottom-up evaluation emerged with varying degrees of stakeholder involvement, including utilization-focused, collaborative, participatory, and empowerment evaluation (Alkin 2004). Methods offered in this literature emphasize the importance of empowering community members to feel ownership of the process, tailoring methods to suit local needs, and ensuring the community benefits from its involvement. For example, participatory monitoring and evaluation, used to evaluate international development programs, is based on ideas from participatory action research (Estrella *et al.* 2000). At local levels, these approaches developed in resistance to evaluations by funders that, in their efforts to make measures 'objective', 'value-free' and 'quantifiable', failed to evaluate adequately from the community perspective. The use of a participatory approach depends on buy-in from all stakeholders, sufficient allocation of time and money, and willingness to be adaptive (Guijt 1999). In another instance, empowerment evaluation takes participation to a deeper level by including ten principles that can be used to evaluate the degree to which an evaluation fosters empowerment. The ten principles of

empowerment evaluation are: improvement, community ownership, inclusion, democratic participation, social justice, community knowledge, evidence-based strategies, capacity building, organizational learning, and accountability (Fetterman and Wandersman 2005).¹¹

The need for this new approach to evaluation is best illustrated by an analysis of a traditional top-down evaluation program. Symonette (2004) describes an assessment she undertook of a problematic evaluation program at the University of Wisconsin. Utilizing an empowerment evaluation lens, Symonette (2004) proposed six goals of a re-envisioned program, including:

Replace the antagonistic and suspicious mind-set with a collaborative mind-set and partnership... eliminate the externally driven, negative incentives... cultivate a vested interest in program data collection and educational outcomes... maximize the natural utility of program data collection, evaluation and reporting as a staff resource for empowered self-improvement... establish program evaluation as an iterative self-diagnostic process for self improvement... [and] design a student-centered program, information, evaluation and reporting system that is more useful, more user-friendly, more accessible, and less onerous" (pg 105).

As Symonette explains, much of the success was due to shifting the evaluation focus and measures development from administrative perspectives to staff and student perspectives, while retaining the university's overall goals. Symonette's (2004) empowerment approach supported staff, changed from the orientation of evaluation from external-accountability- and compliance, to affirming staff progress and engaging staff. For staff, evaluation was transformed from a burden to a resource for program improvement.

This example demonstrates the difference between top-down and bottom-up approaches to evaluation and illustrates the improved criteria, indicators and measures that result from a participatory process, but also the empowering effect of the underlying philosophy. Such a shift in the purpose of C&I applications is necessary to ensure evaluation will be implemented by

¹¹ See Section 6.3 for an in-depth discussion of each of these ten principles.

staff, supported by a co-management board and partner communities, and integrated into an adaptive management regime.

2.5.2 Aboriginal Involvement in Evaluation

To successfully create local-level measures in a co-management context, the methods employed must address Aboriginal perspectives. New approaches are needed as alternatives to top-down C&I development, which is rooted in scientific and Western thinking about evaluation. Top-down program evaluations involving First Nations present unique challenges (Merryfield 1985). Evaluators cite fundamental cultural differences such as “a different reality,” “lack of shared assumptions,” “different mind-sets,” and “different frames of reference” as a main source of cross-cultural problems (Merryfield 1985, pg 5-6). These challenges are compounded by differences in underlying beliefs, values, and communication styles; use of language, educational background, and program expectations (Merryfield 1985).

Participatory monitoring in a cross-cultural context requires particular attention to rigor and quality. Symonette (2004) explains that continual effort is needed to conduct evaluation work in a multicultural environment; one must proactively survey the shifting socio-political and socio-cultural terrain, continually assess and refine her/his perceptive abilities, and cultivate an empathetic perspective that acknowledges one's own biases.

Kirkhart (1995) defines three dimensions of evaluation validity in a multicultural setting: methodological validity, interpersonal validity, and consequential validity. The two components of methodological validity are measurement validity and design logic validity. Measurement validity is comprised of face validity, content validity, criterion-related validity, and construct validity. Adherence to measurement validity can be assessed by asking questions of the results:

“Do the [measures] appear relevant to people in a cultural context (face validity)? Have the [measures] been examined for content relevance (content validity)? Have the measures selected been validated against external criteria that themselves are culturally relevant (criterion-related validity)? Have abstractions used been developed within the appropriate cultural context (construct validity)?” (Kirkhart 1995, pg 4-5).

Design logic refers to how the method addresses standard definitions of internal and external validity (Kirkhart 1995), which are reviewed in Section 4.1. Interpersonal validity speaks to a researcher’s awareness and sensibility, addressing for example cross-cultural communication barriers, biases based on the researcher’s own culture, and other dimensions of interpersonal influence. Achieving interpersonal validity involves reflexivity and demonstrating “a willingness to relinquish premature cognitive commitments” (Kirkhart 1995, pg 5). Consequential validity refers to “the worth, adequacy, or appropriateness of actions resulting from the evaluation”, such as training and empowerment (Kirkhart 1995, pg 6). This relates to standards of community-based research, which require that research produces community benefits as well as academic findings (Kowalsky *et al.* 1996; Smith 1999). Both the evaluation exercise and the results of the evaluation have the capacity to effect change (Kirkhart 1995).

When working in First Nations communities, cultural foundations such as holistic thinking, connection to place, a strong sense of community, orality, ethics of respect, and empowerment need to be the basis of evaluation programs (LaFrance 2004). Formative (on-going) evaluation, clear communication of the evaluation concept, participatory practice and capacity building, and the use of both quantitative and qualitative techniques are all critical features of a “culturally-competent” evaluation with First Nations (LaFrance 2005).

It was critical for me to understand and attend to these aforementioned components of validity in order to establish a strong methodological foundation for this research, develop the proposed method (Chapter 4) and evaluate the success of the method (Chapter 5). This

interpretation of validity was also used as a criterion to delineate effective Tl'azt'en measures of adaptive forest co-management (Section 5.2).

2.6 Appropriate Methods for Developing Measures with an Aboriginal Community

Ad hoc and expert-driven methods have been used to develop prevailing measures (Sherry *et al.* nd-b). There is a risk that these approaches to evaluation may perpetuate colonialism by demanding 'scientific' models and discounting local knowledge systems (Merryfield 1985). Thus, exploration of the participatory evaluation literature and examples of community-based evaluation in practice are required to establish an effective methodology for measures development with Aboriginal people.

2.6.1 Existing Methods

Methods were reviewed from a variety of projects that were undertaken to develop bottom-up measures. Relevant projects included those meaningfully involving indigenous peoples¹² in the development of measures at the local level (Parlee and Lutsel K'e First Nation 1997; Alzate 2000; Blauert and Quintanar 2000; Sidersky and Guijt 2000; Torres D. 2000; Parkins, Stedman, and Varghese 2001; Natcher and Hickey 2002a; Smyth 2002; Kotwal and Chandurkar 2003a; Karjala, Sherry, and Dewhurst 2004; Pokorny *et al.* 2004). At a minimum, each project needed to involve an indigenous community and include participatory monitoring of conditions in an Aboriginal community or the benefits and/or rights the community receives from land management. In cases involving land management, contexts included forest co-management, forest management, protected areas management, and community development

¹² These cases involve peoples described as 'First Nations' in Canadian contexts, or as 'indigenous peoples' in Asian, Central American, and Australian contexts.

projects. Other parties involved in management arrangements included government, industry, and non-governmental organizations. Monitoring contexts included co-management success, sustainability, and community health and well-being. The standards of publication were varied, ranging from peer-reviewed articles to technical reports. Some publications contained clearly described methods, and others lacked the critical details needed for replication. A number of key lessons about effective measures development methodologies with First Nations were learned through the analysis of participatory evaluation in practice. Common threads were identified among the cases reviewed, and are described in the following pages.

2.6.2 Lessons on Approaching Measures Development

Selection of indicators and measures is one of the most difficult steps in participatory monitoring and evaluation (Guijt 2000). Using a participatory approach means that measures are ‘negotiated’ and context-specific rather than pre-defined and ‘objective’ (Guijt 2000). Because measures are meant to be an evolving, adaptive mechanism, agreeing to the “perfect” measures should not be the main objective. In one project, many of the original indicators were found to be obsolete after new insights were gained, and after the organization’s goals and activities were changed (Sidersky and Guijt 2000). Furthermore, no one method works best for developing local level measures of success, even across a community. The authors acknowledge that different methods will be required for exploring different measures areas or themes (Blauert and Quintanar 2000). Table 2.2 summarizes some stages of the methods employed in the various measures development projects reviewed in this section. The following sub-sections describe the table in the text.

Table 2.2. A summary of methods used to develop measures at the local level with Aboriginal people.

Study	Participant Selection	Capacity Building	Idea Generation	Formulation of Measures	Verification
<i>Northwest Territories, Canada (Parlee and Lutsel K'e First Nation 1997)</i>	<i>Elders:</i> Open invitation to a workshop <i>Youth:</i> participants in an existing training & research program <i>Children:</i> elementary students at Lutsel K'e School <i>Homevisits:</i> Unknown, possibly attempted a census <i>Administrators:</i> Attendants at a Joint Workshop with the 'Social Development' and 'Lands & Environment' Committees	Hiring and training of one community researcher, language training for lead (non-Aboriginal) researcher	School visits, Elders workshop, home-visit interviews, youth field discussion, children's mapping exercise, administrators' workshop	Content analysis of interviews by community researchers, workshop information synthesized	Presented results to community; gathered input on analysis methods; approach modified to increase communication with community and administrative offices.
<i>Colombia (Alzate 2000)</i>	Farmers who regularly participate in the program	Discuss what monitoring is, agree to a process to design a system, prioritization of indicator areas	Field-based discussions; "What information would you need to be convinced that you are making progress in achieving that objective?"; Debates in sub-groups, refining and prioritizing in larger groups. ¹³	No discrete verification stage (unnecessary as the participants were involved in the full spectrum of the measures development process)	

¹³ Both the idea generation and the measures formulation processes occurred throughout the field based discussions.

Study	Participant Selection	Capacity Building	Idea Generation	Formulation of Measures	Verification
<i>Oaxaca, Mexico (Blauert and Quintanar 2000) (CETAMEX, farmer-extension program)</i>	<i>Program beneficiaries:</i> farmers who participate in the program from four villages, <i>Program staff:</i> All farmer-extensionists	Participatory Rural Appraisal (PRA) training workshops for staff and farmers	Organizational ethnography (semi-structured interviews with staff to create oral histories); series of workshops, field exercises and focus groups with farmers using PRA tools for measures development; use of a funder-provided value framework for criteria	Group use of PRA tools, including Venn diagrams, farm profiles, flow diagrams, seasonal calendars, social mapping, matrix ranking, etc.	No discrete verification stage (unnecessary as the participants were involved in the full spectrum of the measures development process)
<i>Paraiba, Brazil (Sidersky and Guijt 2000)</i>	<i>Local Farmers:</i> All farmers, 5 also are extension program staff, and 10 act as local 'animators' (facilitators)	Field-based training through demonstration of the method	Breakout into sub-groups to brainstorm environmental measures; debate within sub-group	Return to the plenary to discuss the selected measures; refined, adjusted and clarified	No discrete verification stage (unnecessary as the participants were involved in the full spectrum of the measures development process)
<i>Montreal Lake, Saskatchewan (Parkins, Siedman, and Varghese 2001)</i>	<i>Community experts:</i> Nomination by community leaders for workshop, 5 participated of 10-20 nominated Snowball sample (survey)	Workshop-introduction (first half of the workshop)	Workshop – activity (second half of the workshop)	Researchers develop indicators, check against criteria for sustainability	Survey with the community to verify (46/51 completed)
<i>Northern Australia (Smyth 2002, 2005)</i>	<i>Community experts:</i> Community-selected through general agreement of a core group of Elders	N/A	Series of focus groups organized and led by Elders; 8-20 people per session, wide range of ages	Categories created by project lead, structured focus group on indicators	Presentation of indicator list back to community group

Study	Participant Selection	Capacity Building	Idea Generation	Formulation of Measures	Verification
<i>Northern Alberta (Natcher and Hickey 2002a; 2002b)</i>	<i>Community Members:</i> broad coverage, maximized participation of all community members aged 16-72	Interview and mapping training for 6 community research assistants	Semi-structured interviews (n=345), focus groups, surveys (n=283) & mapping during community functions; male & female community researchers	Unknown; seems to have been conducted by researchers	Unknown, only preliminary findings were reported; author reports no upcoming publications
<i>Northern BC (Karjala 2001; Karjala, Sherry, and Dewhurst 2003; Sherry, Karjala, and Dewhurst 2005) (AFPP)</i>	<i>N/A:</i> Archival analysis, thus selection variable depending on previous methods	4-day workshop for community researchers, daily mentorship and on-the-job training	Archival analysis (e.g., interviews, traditional use studies, maps, etc.)	Group content analysis of archival information involving community researchers	Local advisory group
<i>Bhopal, India (Kotwal and Chandurkar 2003a)</i>	<i>Key Forest Actors:</i> Joint Forest Management committee members (n=74), plus 5 foresters and 1 civil society rep	Open-house discussions, group exercises, games, analogies of measures	Overview session with participants, structured workshop	Break-out groups from workshop, report back to the group for discussion, produces draft C&I	Field validation, additional indicators added
<i>Brazilian Amazon (Pokorny et al. 2004)</i>	<i>Stakeholder Groups (KFA):</i> Screened from a larger pool of KFAs based on ability to complete tasks; stakeholder groups included local forest actors, practitioners and academics	One week training for participants	Participant groups chose from Generic C&I, collected field data, and evaluated the verifiers, indicators and criteria on 1-4 scale of value	Discussion of process in a 3-day workshop, rearranged the groups, so one of each stakeholder in each group	Conducted during workshop

2.6.2.1 Need for a Conceptual Framework

To promote effective data management, some type of conceptual framework should be utilized. Many researchers and practitioners use a criteria and indicators approach (Wright 1999; Natcher and Hickey 2002a; Smyth 2002; Kotwal and Chandurkar 2003a; Pokorny *et al.* 2004). Others in the international development field have adopted a systems based on the 'grassroots development framework' created by the Inter-American Foundation, which organizes measures according to scale and tangibility (Blauert and Quintanar 2000; Torres D. 2000). Others working with a smaller scope and at smaller scale have simply categorized data into themes (Parkins, Stedman, and Varghese 2001).

2.6.2.2 Cross-cultural Communication

Language and styles of interaction can be major barriers and sources of misunderstanding and error in cross-cultural evaluation (Merryfield 1985, Sherry 2002). In Western culture, it is acceptable for researchers to ask strangers direct questions, requesting critical analysis and their perceptions of weaknesses in a program; this is often in contrast to other cultures, particularly non-scientific societies (Merryfield 1985). This point may also need to be considered when asking First Nations to recommend measures which will in turn be used to ask community member to be critical of programs. One project evaluating a program intended to benefit farmers in Mexican villages noted that farmers were "very cautious and polite", and "generally avoided open criticism or conflict" (Blauert and Quintanar 2000). It is likely this observation holds true for many rural indigenous peoples in Canada as well. Tl'azt'enne have been involved in research primarily through verbal participation, such as one-on-one and group interviews, occasionally mixed with activities such as forest walks, and sometimes using visual methods like mapping

(Booth 1998; Morris and Fondahl 2002; Morris 1999a; Karjala, Sherry, and Dewhurst 2004; Karjala and Dewhurst 2003). Tl'azt'enne provided positive feedback to an approach called the *Aboriginal Forest Planning Process* that combined oral, visual and written data into a written forest management plan (Sherry, Karjala, and Dewhurst 2005).

The language and concepts used in evaluation can be confusing, even among evaluators (Hopson, Lucas, and Peterson 2000). That confusion is amplified in a cross-cultural environment, particularly if participants are working in their second language, or if participants are Elders or people with low literacy skills (Parlee and Lutsel K'e First Nation 1997; Guijt 2000). As one community member explained when commenting on an evaluation process, "You can't assume our English is interchangeable with their English. There are many English languages" (Merryfield 1985, pg 9). Further, Pokorny *et al.* (2004) found local people had difficulty working with abstract monitoring concepts, and recommended that evaluation involving local people focus at the implementation level.

Methodological concerns relating to cross-cultural communication can be addressed by increasing community participation in project design. For example, some projects asked participants to help identify appropriate terminology and definitions. For example, the term 'indicators' was replaced with 'fruits of our labour' or 'information' (Guijt 2000). As a more thorough example, the Lutsel K'e developed their definitions for monitoring terminology, as shown in Figure 2.4. Other strategies for improving cross-cultural communication include the use of translators if the first language of evaluation participants is different from that of the evaluators (Parlee and Lutsel K'e First Nation 1997). Critical to enhancing cross-cultural communication is involving local people all stages of a project (Parlee and Lutsel K'e First Nation 1997, Estrella *et al.* 2000, Sherry *et al.* nd-c).

	<i>Chipewyan</i>	<i>English equivalent</i>
<i>Monitoring</i>	Net í horédhâ honeltÿn, benerédí, dhi bek orejâ t asi ædönúdhier já alá háyorilâ náts edé sí.	Watching, listening, learning and understanding about changes in the community
	Dÿne ch aniaë yunizî dô tthi yunedhé há yorila yé ghâ dáûyâ	Being wise about the Dene way of life past, present and future
<i>Indicators</i>	Tasi ædö núdhier	The things that are changing
	Tasi dÿne da nádhier	Visions
<i>Community Health</i>		Self-government, healing, cultural preservation
	Alâ horila nezö hóâm	United community
	Dÿne ch ániäë	Dene way of life

Figure 2.4. These definitions developed by the Lutsel K'e First Nation for monitoring community health demonstrate one approach to enhancing cross-cultural communication in an Aboriginal monitoring program. (Source: Parlee and Lutsel K'e First Nation, 1997, pg 7)

2.6.2.3 Extent of Participation

Projects for developing measures occur within a spectrum of participation. Research objectives generally drive non-participatory measures development processes, where researchers inquire into the values of community members and develop measures based on that information for academic needs, rather than emphasizing community outcomes such as developing or enhancing community capacity, improving community programs or conditions, and producing community-focused extension materials (e.g., Parkins, Stedman, and Varghese 2001). Higher levels of community involvement are often associated with greater benefits to the community in

terms of capacity building and empowerment (Guijt 2000) and can enhance research outcomes through increasing: trust between researchers and community members, the relevance of the research questions, the quantity and quality of results, the use and relevance of data, and dissemination (O'Fallon and Dearry 2005). As well, greater community participation also assists with translation of research into policy, development of new research questions, extension of research beyond the specific project, and building of research infrastructure and sustainability (O'Fallon and Dearry 2005). At the highest level of participation, community members identify the need for the monitoring program, receive training on evaluation methods, help develop and execute the methods, and formulate the measures themselves based on their values (e.g., Parlee and Lutsel K'e First Nation 1997; Blauert and Quintanar 2000). There are, however, drawbacks to participatory processes. These include larger investments of time and money, use of limited community capacity, and compromise on behalf of external partners (Guijt 1999). If the community seeks the advice of technical experts for a locally identified problem, the study may benefit from a lower level of participation in certain stages such as research design. For example, a study on toxicology of traditional foods originated from community concerns and involved the participation of local people, but scientific laboratory work was undertaken by university researchers (e.g., Chan and Yeboah 2000).

2.6.2.4 Capacity Building / Scope of Involvement

Even the most basic participatory measures development processes require community capacity building. One option is to explain evaluation concepts during an educational session for research participants, utilizing cross-cultural communication skills as necessary (Alzate 2000; Blauert and Quintanar 2000; Sidersky and Guijt 2000; Parkins, Stedman, and Varghese 2001;

Kotwal and Chandurkar 2003a; Pokorny *et al.* 2004). This approach may or may not result in the articulation of measures by participants.

The second option is to focus on building evaluation capacity in a group of community researchers who will participate in many aspects of research, not simply the data generation stage. These community researchers can then determine community perspectives on monitoring and evaluation in a less technical way. For example, community researchers can ask participants questions such as “What do you value about ...?”, or “What is changing in ...?”. These community researchers can oversee or participate in the transformation of community perspectives into measures (Parlee and Lutsel K'e First Nation 1997; Natcher and Hickey 2002a; Smyth 2002).

2.6.2.5 Participant Selection

Participatory monitoring and evaluation projects typically use non-probabilistic, ‘purposive sampling’ (Guba and Lincoln 1989; Patton 1990). The methods identified in previous monitoring projects have used two purposive approaches for selecting participants. The first is a ‘extensive sampling strategy’, where researchers involve many people and use broad criteria for participant selection. In one example, Natcher and Hickey (2002b) attempted to “enhance overall community coverage” (pg 9) by completing 238 interviews and 345 surveys (from a total of approximately 2500 members) with community members between the ages of 16 and 72 in a diversity of settings. Similarly, the Lutsel K’e community health monitoring program utilized a variety of data generation sessions in the small community, including two community

workshops, two school visits, a field trip, and 105 family interviews¹⁴ ('homevisits') (Parlee and Lutsel K'e First Nation 1997). Typically, this type of sampling is considered complete when idea saturation is reached (Guest 2006), although rationale for the number of participants selected was not explained in either study (Parlee and Lutsel K'e First Nation 1997; Natcher and Hickey 2002a, 2002b). Karjala, Sherry and Dewhurst. (2004) did not generate new data with participants; however, the study was similar to the previous examples, as researchers gathered as much information as possible from community archives, including research interviews, traditional use study documentation, Elders' interviews, and secondary sources. The strength of the 'extensive sampling strategy' is that the number and diversity of community perspectives are maximized, reducing the possibility of researcher bias in selecting participants. Unfortunately, this approach results in a large amount of data which requires time and resources for data collection, processing and management. This increased burden necessitates tradeoffs, and thus may restrict the depth of information gained from each participant (Knodel 1993).

The other approach is expert-based participation, where 'local experts' are involved based on certain qualifications (Delbecq, Van de Ven, and Gustafson 1975; Sherry 2002). For example, some have selected representatives of important stakeholder groups, ensuring participants are team-oriented and intellectually capable of completing the exercise (Pokorny *et al.* 2004). Nominations from community leaders have also been used to choose participants (Parkins, Stedman, and Varghese 2001). Existing stakeholder groups may be used; a project in

¹⁴ Statistics Canada reports that Lutsel K'e had a population of 305 with 85 dwellings in 1996, and a population of 248 with 70 dwellings in 2001. Statistics Canada. 2002. 2001 Community Profiles. Released June 27, 2002. Last modified: 2005-11-30. Statistics Canada Catalogue no. 93F0053XIE. <http://www12.statcan.ca/english/Profil01/CP01/Index.cfm?Lang=E> (accessed August 7, 2006).

India worked with local co-management representatives and staff (Kotwal and Chandurkar 2003a). Parlee and Lutsel K'e First Nation (1997) worked with a group of youth who were already participating in a community-based monitoring program.

The expert-based approach seeks to include the 'best' participants according to a narrower set of criteria, as opposed to sampling a larger population (probabilistic sampling) or using broad and/or fewer criteria (Delbecq, Van de Ven, and Gustafson 1975; Powell 2002). While there is a risk of bias when participants are selected based on expert-criteria (Patton 2002), this can be overcome by democratizing the process of expert selection, and redefining the term 'expert' (Sherry 2002; Davis and Wagner 2003; Sherry *et al.* nd-b). For the *C&I of Adaptive Forest Co-management* project, a participatory expert-selection process employed techniques including peer nominations, invitations and snowballing, and identification of significant forest actors. Expert criteria for nomination included representative experience, recognized authority, sufficient expertise, direct interest or stake, and willingness to participate (Sherry *et al.* nd-b).

2.6.2.6 Use of Iterative Design

All participatory measures development projects reviewed incorporate an iterative design, which helps to ensure internal validity of the data (Guba and Lincoln 1989) and allows for enhanced participation (Estrella *et al.* 2000). An overview and comparison of methods utilized in these studies is reported in Table 2.2. For these projects multiple sessions were usually needed as all stages of measures development could not occur in one day. In all projects, researchers interacted with participants (or community researchers) either in small or large groups (Alzate 2000; Blauert and Quintanar 2000; Sidersky and Guijt; Smyth 2002; Kotwal and Chandurkar 2003a; Pokorny *et al.* 2004; Sherry *et al.* 2005b), which were occasionally combined with single-person interviews (Parlee and Lutsel K'e First Nation 1997; Natcher and Hickey 2002a) or

surveys (Parkins, Stedman and Varghese 2001) . Many measures development processes are part of a larger monitoring program, therefore isolating the process into discrete stages is somewhat artificial, particularly as measures need continual re-evaluation over time.

2.6.2.7 Group Measures Development Processes

Measures development processes require group interaction to be effective. According to Guijt (2000), it is critical that measures development processes involve debate and negotiation. In order to reduce the number of measures for manageability, exploration of multiple views and priorities is necessary (Guijt 2000). Collaborative measures development processes have been shown to facilitate shared visioning (Torres D. 2000; Karjala, Sherry, and Dewhurst 2003). Particularly when dealing with groups that differ strongly, flexibility and communication are essential, and power dynamics must be monitored to ensure fair representation (Guijt 2000). When consensus is not reached, multiple measures sets can be utilized in monitoring rather than forcing group decisions (Guijt 2000).

2.6.2.8 Managing the Measures Set

Many monitoring projects utilize ‘criteria for effective measures’ as a tool for screening measures (Warren 1997, Cobb and Rixford 1998; von Mirbach 2000b; Elias nd). Local level monitoring projects have employed a variety of approaches to screen measures, ranging from expert-driven to consensus-based (Prabhu *et al.* 1996; Parkins, Stedman, and Varghese 2001; Pokorny *et al.* 2004). One project asked participants to rate measures based on criteria defined by academically-trained experts (Pokorny *et al.* 2004). In another, researchers used criteria of effective sustainability measures to reduce a list of measures drafted by community participants (Parkins, Stedman, and Varghese 2001); this process is outlined in Figure 2.5. Final selection of

indicators can also be established by consensus-based approaches or by individual stakeholder assessments such as matrix scoring¹⁵ (Guijt 2000; CIFOR C&I Team 1999). As part of an adaptive management strategy, it is expected that institutions and their programs will change over time. Thus, continual revision and updating of measures is also important, as social, political and environmental conditions shift (Sidersky and Guijt 2000).

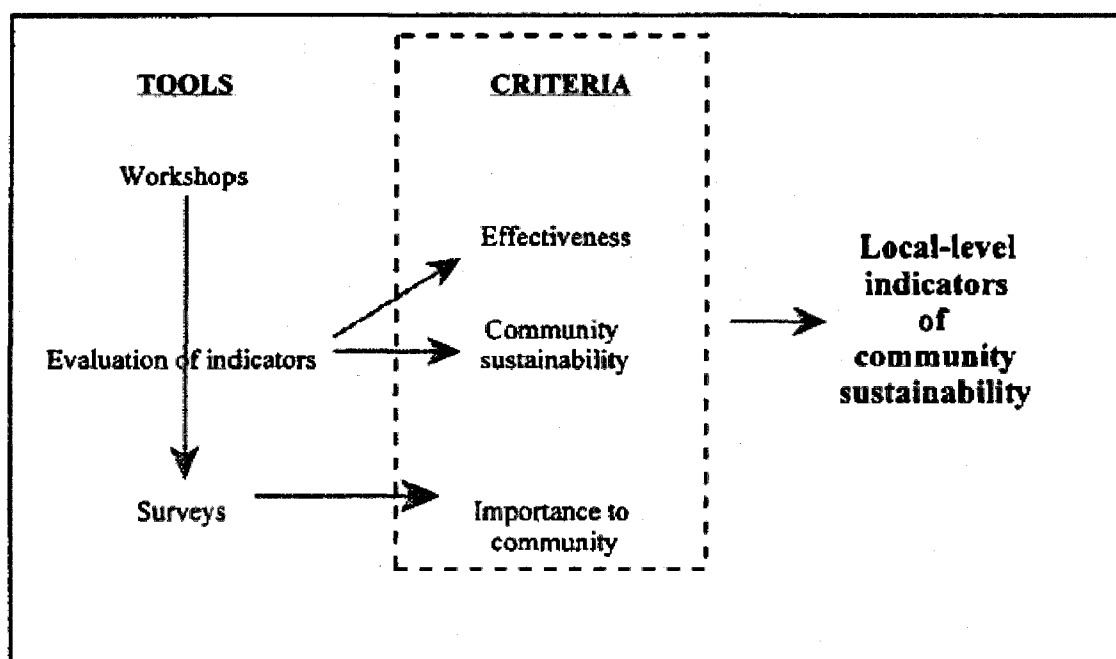


Figure 2.5. An example of an approach to indicator evaluation (Source: Parkins, Stedman, and Varghese 2001, pg 50).

2.6.2.9 Selecting an Appropriate Method

In participatory evaluation, the most important consideration in the selection of methods for measures development is suitability for the community (Estrella *et al.* 2000). The authors of the book, “Empowerment Evaluation” emphasize the importance of allowing participants to use whatever approaches work best for them (Fetterman and Wandersman 2005). Davis-Case (1989)

¹⁵ Matrix scoring is a simple diagrammatic method for combining prioritization preferences of a group.

recommends watching, listening, observing and asking what methods are used in the community for communicating information, and identifying what methods have been used successfully in the past (Davis-Case 1989).

Evaluators have utilized a wide variety of successful data collection methods, ranging from interviews and workshops to puppet shows and murals¹⁶ (Davis-Case 1989). In participatory monitoring and evaluation, facilitators mainly use workshop or discussion groups (Guijt 2000). To develop measures in rural community settings, methods have included Participatory Rural Appraisal (PRA) techniques such as ranking, rating, key judges¹⁷, questionnaires, mapping, and drawing (Estrella *et al.* 2000; Abes 2000). Davis-Case (1989) describes 23 participatory techniques, according to communication style (visual, oral or written), evaluation type, objectives and purposes of the tool, and strengths and weaknesses of each. Estrella *et al.* (2000) review a number of participatory evaluations in developing countries, which use a range of techniques, each slightly different to suit the dynamics of each community. These studies reveal that the most important factor in choosing a method is an understanding of the community in order to determine what approach is most appropriate.

2.6.3 Summary

In reviewing measures selection projects, some important methodological components emerge. Firstly, the underlying philosophy must be rooted in community values. As well,

¹⁶ Puppet shows, as with popular dramas, are used for community problem analysis, monitoring qualitative indicators, extension, and communicating monitoring results. Community members or facilitators can perform skits based on community issues. It allows for multiple viewpoints on an issue, is entertaining and engaging, and is helpful for delving into contentious issues. Performances led to discussions with an audience that can be recorded for analysis.

Murals can be used to stimulate discussion on visual objectives, communicate extension messages, depict problems or solutions, and show a community vision for the future. Participation is central to choosing location and content of the mural, which is completed by an artist. Murals of a desired future condition can be used to monitor and evaluate progress towards a vision.

¹⁷ Key judges are community members that are involved in verifying and categorizing previously collected qualitative data.

methods must be designed so that the end-product has relevance for those who will be expected to implement the evaluation system (e.g., community members, co-management staff). The process itself must have multiple stages for integration of community input into the research design and the results, which can be achieved through an iterative design and engagement of community researchers. In the spirit of community-based research, efforts should be made towards community empowerment. Capacity building through employment, mentorship, training, and information sharing is a necessary component of the measures development process.

Use of local experts has proven successful in the literature, although processes for expert selection have varied. Experts may be defined through formal information gathering processes, or by engaging pre-established groups. While some academic sources warn against “convenience sampling”, community-driven processes have utilized existing groups, which may be convenient for participants, as well as researchers (e.g., Parlee and Lutsel K'e First Nation 1997). While a community census would maximize input, those who attempt it may revert to convenience sampling due to resource limitations.

A good understanding of the community is essential for determining appropriate communication styles and the extent and type of participation in the process. The level of community capacity in terms of skills and abilities, as well as the availability of personnel/participants must be considered.

3. Case Study Description: Tl'azt'en Nation and the John Prince Research Forest

3.1 *Tl'azt'en Nation*

This thesis focuses on the John Prince Research Forest (JPRF) co-management partnership, of which Tl'azt'en Nation is a partner. An introduction of the community is necessary to understand the context in which they recommend measures for evaluating the JPRF.

3.1.1 Overview

Tl'azt'en Nation is part of the Dakelh (Carrier) linguistic group, and is affiliated with the Carrier-Sekani Tribal Council through treaty negotiations. The nations which comprise the Dakelh peoples historically had close interconnections through family relations, social and economic ties, and shared history, culture and language, which contribute to the present day (Furniss 2004). Tl'azt'en Nation was previously known as the Stuart Lake-Trembleur Band, an amalgamation of five villages: Tache, Binche, Yekooche¹⁸, Dzitl'ainli, and Kuzche. In 1988, the band adopted the Dakelh-based name, 'Tl'azt'en Nation'. Approximately 640 people live in the Tl'azt'en villages of Tache, Binche, Dzit'ainli, and seasonally at Kuzche; another some 650 members live off-reserve (Sherry, Karjala and Dewhurst 2005).

Tl'azt'enne define themselves largely by their territory. Tl'azt'en Nation's traditional territory covers an area of 6,560 km² in central British Columbia, just north of the community of Fort St. James as shown in Figure 3.1.

¹⁸ Yekooche separated from Tl'azt'en Nation in 1994 to pursue treaty negotiations independently.

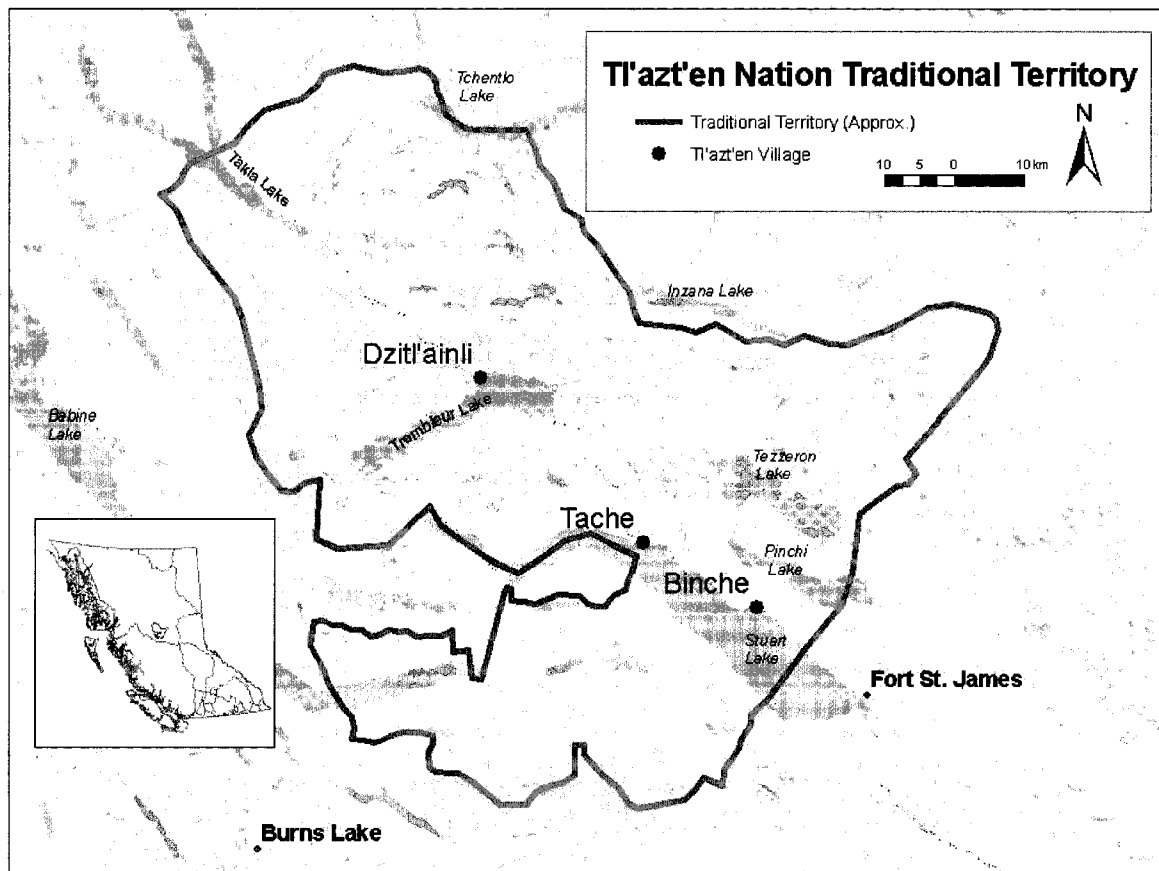


Figure 3.1. Tl'azt'en Nation Traditional Territory, north central British Columbia (Source: adapted by N. Elliot from Tl'azt'en Nation Treaty Office, 2007).

This forested territory is centered on *Nakal bun* and *Dzinghu bun* (Stuart and Trembleur Lakes), and includes many smaller lakes, rivers, streams and wetlands. The forest, lakes and rivers are an integral part of their culture, including their economic livelihoods, social activities, cultural expression, language, governance, education, and spiritual relationships. As a member of Tl'azt'en Nation explains: “If we lose the land, we lose whatever’s on the land and then we’re no people at all because we are in this one big circle with the land... There’s fish, wildlife, and

berries, trees and that, and First Nations are right along in this circle here.”¹⁹ Tl'azt'en youth describe their community as follows:

Tl'azt'en Nation, “people by the edge of the bay”, is a First Nation community situated in north-central British Columbia, Canada. We know ourselves as Dakelh (we travel by water) but Europeans called us “Carriers”. Our language, Dakelh, is part of the Athapaskan language group.

Prior to contact, Tl'azt'en's traditional territory covered a vast area along Stuart Lake running up the Tache River almost to Takla Lake to the north. The Keyoh (land) was managed by family units and the family head controlled the hunting, fishing and gathering in his Keyoh. It was not until the late 1800's that Tl'azt'enne began to gather in central communities in response to the fur trade and the dictates of the Roman Catholic Church.²⁰

The largest village, Tache, is Tl'azt'en Nation's administrative center, and houses offices of chief and council, natural resources management, health, education and community justice. The community also operates Eugene Joseph Elementary School and a daycare (Sherry *et al.* 2005). Tl'azt'en provides periodic education and training opportunities, such as post-secondary programs, alternative secondary school programs, adult basic education and outdoor education for children. Local employers have also offered training programs, relating mostly to forestry field work (Hodder and Sherry 2005).

The majority of Tl'azt'enne active in the workforce participate in the forest industry (Sherry, Karjala, and Dewhurst 2005). Aside from JPRF and Tanizul Timber, a local mill, Teeslee Forest Products, opened in 1990 to ensure wood from the Tree Farm License could be processed locally (Booth 1998). Due to outdated technologies and unstable markets, the mill closed in 1998, but has subsequently been reopened for brief periods²¹. The community also opened a cabinet shop in 1998, which was forced to close following a fire. Tl'azt'enne also

¹⁹ An interview by Beverly Leon (John) with a Tl'azt'en community member, January 14th 2004, in Tache, BC, for research on the Criteria and Indicators of Adaptive Co-management project. Anonymity is preserved as requested by the interviewee.

²⁰ From <http://www.tlc.baremetal.com>, accessed June 21, 2006.

²¹ Personal Communication, Susan Grainger, June, 2007.

participate in the fur industry; Tl'azt'en families operate thirty traplines on their *keyohs* (Sherry, Karjala, and Dewhurst 2005).

Economic development in Tl'azt'en Nation has been limited, particularly in comparison to neighboring non-Aboriginal communities. There are few opportunities for local employment, meaning many Tl'azt'enne must travel to the nearby community of Fort St. James to work, which requires an approximately 45-minute drive from the main village of Tache (Hodder and Sherry 2005). The majority of community members lack many of the skills and qualifications necessary to participate in the local labour market (Hodder and Sherry 2005). Despite these obstacles, Tl'azt'enne continue to focus on their future and are working hard to ensure their children and youth have opportunities for education, employment, and healthy, positive lifestyles.²²

3.1.2 Traditional Tl'azt'en Culture

Tl'azt'enne describe their contemporary culture as being based in traditional values.²³ The importance of traditional values is reflected in the community's vision of a well-educated Tl'azt'enne. Community research has helped to articulate the community's ideals: Tl'azt'enne should have the ability to "walk in both worlds", meaning that they should be fluent in the ways of their traditional culture, but also contribute as members of contemporary society of which they are a part.²⁴ Many members of the community including Elders and youth emphasized that Tl'azt'enne should have a strong relationship with the land.²⁵ They linked success in the future to having pride in their rich cultural heritage, and engaging in traditional activities on the land.²⁶

²² An interview by Beverly Leon (John) with a Tl'azt'en community member, January 14th 2004, in Tache, BC, for research on the Criteria and Indicators of Adaptive Co-management project.

²³ Unpublished data from the CURA Aboriginal Education Stream. Information about the project is available at: <http://cura.unbc.ca/education.htm>

²⁴ Ibid.

²⁵ Ibid.

²⁶ Ibid.

Knowledge of Dakelh language, place names, history, dances, songs and games is also critical, as is traditional environmental knowledge which includes (but is not limited to) medicinal plants, and food gathering and preparation, particularly related to hunting, fishing, trapping and plant gathering.²⁷

As this linkage between traditional ways of life and Tl'azt'en values has been made, it is critical to explore Tl'azt'en culture from a historical perspective as well. Tl'azt'enne have depended on their territory since time immemorial for their survival. Seasonal changes directed Tl'azt'en activities, as types and availability of resources shifted throughout the year. As for other Dakelh Nations, the Tl'azt'en pattern of activity followed the 'seasonal round' (Furniss 2004). The salmon run in late summer was a critical source of sustenance and marked a time when the community gathered at fishing sites (Furniss 2004; Hudson 1983). Cooperation was needed to catch fish in weirs, clean and prepare the salmon for storage while still making time for collecting berries (Furniss 2004; Hudson 1983). In the fall, families returned to their *keyohs*, or family territories, where Tl'azt'enne relied on ungulates, small mammals, and stores from the summer for sustenance (Furniss 2004; Hudson 1983). Early spring was a time of scarcity, where Tl'azt'enne depended on ice fishing and the harvesting and preparation of cambium and lichens (Furniss 2004).

Through *bahtlats* (potlatch), a formal system of governance where the clans gathered to reaffirm power, make key decisions, and celebrate important life events (Brown 2002). Access rights and resources were allocated among clan members through the *keyoh* system, and rules were strictly enforced (Morris and Fondahl 2002). Clan membership was matrilineal (Hudson 1983; Brown 2002). The clans of Tl'azt'en Nation include *Lusilyoo* (frog), *Lojobou* (bear), *Lhts'musyoo* (beaver), and *Kwun Ba Whut'en* (caribou); these were divided further into sub-

²⁷ Ibid.

clans. Throughout Dakelh territory, access and use rights to *keyohs* were regulated and redistributed by clan leaders known as *Dene Za* (male) or *Tseke Za* (female), depending on the needs of each family (Brown 2002; Hudson 1983). *Keyohs* are clan territories, essentially homelands, which “serve as the material, cultural, and spiritual basis for sustaining human life” (Brown 2002, pg 28). Many of these systems are in practice today, but in a modified form.²⁸

Recently, Tl’azt’en Nation has undertaken various projects to revitalize traditional culture, particularly through Treaty Office activities. For example, Beverly Bird, Director of Research and Development for Tl’azt’en Nation, is working to develop culturally-based management plans using customary law and institutions (Bird 2006). Much of this work requires research on place names, traditional use sites, genealogy and clan territories, which additionally contributes to “understanding, preserving and restoring our [Tl’azt’en] language” (Bird 2006). Further, Chuntoh Education Society, a charity established by Tl’azt’en Nation, the JPRF and UNBC, has endeavored to provide Tl’azt’en children with hands-on learning opportunities that teach scientific and cultural knowledge. Specifically, society members have created a program called *Yunk’ut Whe Ts’o Dul’eh*, meaning “We Learn from our Land”, which centers learning on the seasonal round of activities important in Dakelh culture (Mitchell 2003). Regional groups such as the Carrier Linguistic Society and the Yinka Dene Language Institute contribute to linguistic revitalization efforts for Tl’azt’enne. Further, recent community efforts have led to the creation of a Tl’azt’en Elders Committee to explore matters pertaining to cultural revitalization.²⁹

For the purposes of this thesis, the term ‘Cultural Revitalization’ means renewing or reinvigorating the traditional values, practices and attitudes of a social group. All of what

²⁸ Personal communication, Beverly John, February 2007.

²⁹ Personal Communication, Susan Grainger, February 23rd, 2007.

constitutes Tl'azt'en culture cannot be defined here; however, Tl'azt'enne have suggested critical elements of Tl'azt'en cultural revitalization in the context of the JPRF, as discussed in Chapter 4 and described in Table 4.1. In the framework established by Sherry *et al.* (nd-a), Tl'azt'en culture formed an integral part of all identified themes. For example, Tl'azt'enne describe values relating to traditional land use, participation in forest management, and forest-related economic development as being a critical foundation of their culture; however, for the purposes of this thesis, these components were not investigated. As well, cross-cultural learning and sharing was not incorporated into this research. For this thesis, the term 'cultural revitalization' refers to the revitalization, restoration and rediscovery of traditional cultural identity emphasizing management efforts and outcomes related more to social and program related functions, and relating less to land use management values such as wildlife habitat and use of traditional knowledge in forest management. This categorization of values is not meant to limit the definition of 'cultural revitalization' in a broader forest management sense, but simply to limit the scope of this research. It is understood that further work is needed to identify measures for all values identified by JPRF partners and stakeholders, many of which relate to Tl'azt'en culture.

3.1.3 Threats to Traditional Tl'azt'en Culture

During early contact with European settlers, Tl'azt'enne completely maintained their governance systems on their traditional territory. Over time, however, provincial and federal regulations began to override these traditional governance systems with the introduction of fishing, hunting and trapping regulations (Morris and Fondahl 2002). Further, the practice of *bahilats* was banned, and, using the Indian Act, the federal government imposed "Indian Bands" and the elected Chief and Council system of governance (Brown 2002). Although Tl'azt'enne benefited initially from economic development in their traditional territory, the growing

influence of the forest industry began to degrade non-timber forest resources important to Tl'azt'enne (Morris and Fondahl 2002). Tl'azt'enne resisted dispossession of their traditional lands, for example, by negotiating for rights to use fishing nets and allocation of additional reserve land (Morris and Fondahl 2002). Pressures of economic development in the 1960s, including the creation of roads and a railway, led to further encroachment on Tl'azt'en territory and heightened discord (Morris and Fondahl 2002). This long-term conflict eventually led to Tl'azt'en Nation's successful bid for Tree Farm License (TFL) 42 in 1984 as a community-managed forest, creating Tanizul Timber Limited (Morris and Fondahl 2002; Booth 1998). While ownership of the land remained with the province, exclusive timber harvesting rights were granted to Tl'azt'en Nation, a landmark for First Nations in Canada (Booth 1998).

3.1.4 Regaining Management Authority over Local Forest Resources

Tl'azt'enne currently have limited authority to manage and use their traditional territory, as the provincial government considers the area to be under its jurisdiction; however, Tl'azt'enne have established cooperative management agreements on some portions of their territory: Tree Farm License 42 (managed by Tanizul Timber), the John Prince Research Forest, and small Indian Reserves scattered across the territory, as shown in Figure 3.2 (Morris 1999b; Sherry, Karjala, and Dewhurst 2005). The remainder of Tl'azt'en territory is designated as Timber Supply Area (TSA) for forestry companies operating in the Prince George, Morice, and Lakes Timber Supply Areas, shown in Figure 3.3.

Tl'azt'enne participate in the management of Tanizul Timber, the John Prince Research Forest, and forestry on reserves. Tl'azt'en Nation's Natural Resources Office is operated by a small staff, which conducts research, reviews land use plans, manages community information, consults with community members, and undertakes other work regarding treaty settlement and

consultation. Tl'azt'enne also oversee the operation of Tanizul Timber; the board of directors is comprised fully by community members. Tl'azt'en Nation and UNBC co-manage the John Prince Research Forest, employing two Tl'azt'enne full-time, and others on a part-time or seasonal basis. While these opportunities have increased the participation of Tl'azt'enne in forest management decision-making, a number of constraints have hindered their ability to manage the forests for local values.

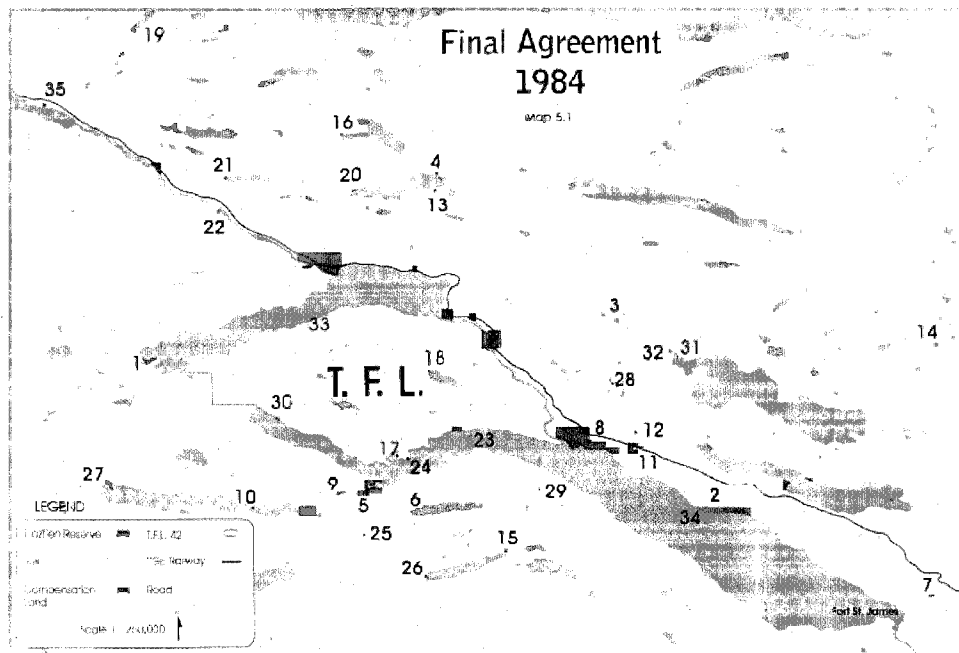


Figure 3.2. Tree Farm License (TFL) 42 was granted to Tl'azt'en Nation in 1984. Numbers refer to Indian Reserves held by Tl'azt'en Nation (Source: Morris 1999b, pg 126).

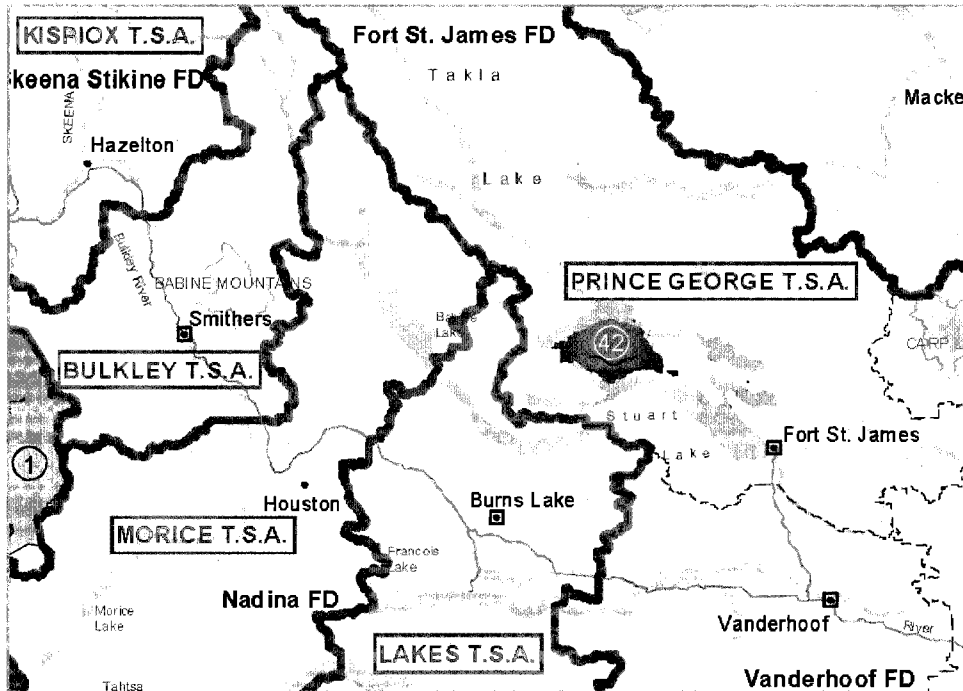


Figure 3.3. From a forestry perspective, Tl'azt'en traditional territory falls within the Prince George and Lakes Timber Supply Areas, and Tree Farm License 42. (Source: <http://www.for.gov.bc.ca/hth/timten/images/tfl-regions-tsas-districts-map-350-dpi-june-2006.pdf>).

Tanizul and JPRF are limited to forest management, regulating only timber harvesting in the context of multiple forest values (i.e., not regulating mining, oil and gas, fishing, hunting or trapping activities). Throughout Tl'azt'en traditional territory, Tl'azt'enne were largely successful in securing traplines through the registered trapline system, although the system does not provide the extent of rights that Tl'azt'enne seek, including protection of traplines from human impacts such as logging (Hudson 1983). Further, traplines do not protect Tl'azt'en rights which were included in the traditional *keyoh* system, such as hunting, fishing and gathering (Hudson 1983). Regulations for subsurface resources, fishing, hunting and trapping are determined by provincial and federal governments. Prior to a policy change in 2004,³⁰ Tanizul Timber's TFL required that

³⁰ See BC Ministry of Forests Backgrounder, January 2004, at: <http://www.for.gov.bc.ca/mof/plan/marketbasedreforms.htm>

a minimum volume of timber was harvested, which forced Tanizul to log more than the community felt was sustainable (Kosek 1993; Booth 1998; Ross and Smith 2002).

Another major constraint to regaining community control over resources is limited capacity in certain fields. Meaningful participation in decision making based on science and western modes of working often requires post-secondary education. Many demands are placed on those community members who have a strong cross-cultural skill set and post-secondary education. Furthermore, participation in natural resource management is only one of many local concerns, others being health and healing, building strong communities, educating children and youth, economic development, and strengthening Tl'azt'en governance and access to resources. Financial limitations of Tl'azt'en Nation government and businesses further restrict opportunities to employ and train Tl'azt'enne.

3.2 The John Prince Research Forest

3.2.1 Overview

The JPRF involves Tl'azt'en Nation's only co-management agreement, and represents ten years of partnership with a non-Aboriginal organization, the University of Northern British Columbia. A physical description of the land base and a review of the JPRF structure, history and programs provide necessary context to fully understand the results of this thesis.

The JPRF is a working forest. Funding is generated primarily through timber sales; approximately 13,000 m³ of softwood is cut annually and sold on the open market to local mills (Grainger, Sherry, and Fondahl 2006). Profit is reinvested in JPRF programs, services, activities and facilities. In 2002, the Cinnabar Resort on Tezzeron Lake was purchased to provide accommodation for students, researchers, and tourists, as well as a site for educational programs.

The resort is used for camping, fishing and hunting. Hiking trails and interpretive features have been developed, and are being expanded (Grainger, Sherry, and Fondahl 2006).

By creating an outdoor facility, Tl'azt'en and the University of Northern British Columbia (UNBC) seek to provide a natural setting for forest research, education and demonstration (Grainger, Sherry, and Fondahl 2006). As a co-managed research and educational facility, the JPRF partners aim to combine scientific and indigenous approaches to land management that integrate and enhance multiple resource values, and contribute to the ecological and social stability of the region (Grainger, Sherry, and Fondahl 2006). The JPRF encompasses 13,032 ha of traditional Tl'azt'en territory between *Chuzghun* (Tezzeron Lake) and *Tesgha bun* (Pinchi Lake) (Figure 3.4).

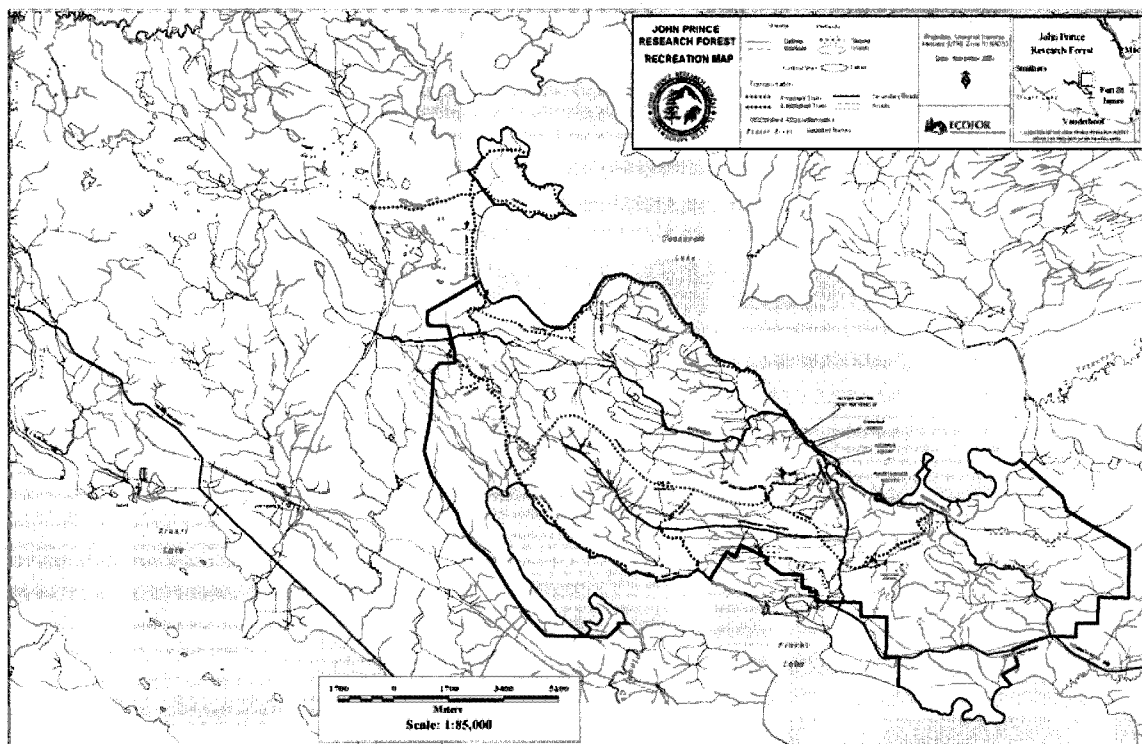


Figure 3.4. The John Prince Research forest is 13,032 ha in size, and is located near the communities of Tache, Binche and Fort St. James, in north-central British Columbia. (Source: JPRF Files).

3.2.1.1 History

In 1993, the Dean of UNBC's Faculty of Natural Resources and Environmental Studies sought a field facility for research and education; the provincial government recommended an unallocated portion of Crown land, which is now known as the John Prince Research Forest. Upon consultation with the traditional land holders, Tl'azt'en Nation, UNBC representatives began to recognize that an equal partnership was necessary (Fondahl and Atkinson 2007). In 1997, the JPRF boundaries were agreed to and a manager was hired. Tenure was granted in 1999 through a Special Use Permit. The first block was harvested that same year (Grainger, Sherry, and Fondahl 2006.).

3.2.1.2 Co-management Structure

In 2001, UNBC and Tl'azt'en Nation established a non-profit company, Chuzghun Resources Corporation, to operate the JPRF co-management board of directors. Each partner appoints three board members and one alternate as its representatives. One Tl'azt'en member and one UNBC member co-chair the Board of Directors (BOD), taking turns leading board meetings that alternate between Tache and Prince George (Grainger, Sherry, and Fondahl 2006). The Board of Directors provides strategic direction for the business and programs of the JPRF, and oversees its financial management and forest operations. JPRF staff implements the board's vision, and includes a manager, two research coordinators, and temporary/seasonal staff as needed. Contractors carry out operational activities such as timber harvesting and silviculture (Grainger, Sherry, and Fondahl 2006).

3.2.1.3 Programs

The JPRF operates as a facility for visiting researchers, and also has an internal research program. There are a range of research opportunities at the JPRF, including forestry operations; wildlife; recreation and tourism; and environmental, social, cultural, and community studies (Sherry and Fondahl 2004). Previous and on-going research projects investigate the co-management partnership, traditional knowledge, environmental monitoring, Aboriginal education, cultural ecotourism, natural disturbance patterns, and community capacity needs (Sherry and Fondahl 2004).

The broad goal of JPRF education and training programs is to help create future natural resource managers and community leaders. For UNBC students, the JPRF hosts Natural Resources Management Field Camp and field trips for courses in biology, geography, natural resource management, planning, and recreation/tourism (Sherry and Fondahl 2004). There are also opportunities for student work experience and volunteering. For Tl'azt'enne, the JPRF runs culture and science camps, and arranges school field trips. Class presentations in local schools are given by staff. Training programs focus on capacity building through employment, work experience, and volunteer opportunities (Sherry and Fondahl 2004). For example, one highly successful initiative helped Tl'azt'en youth build skills through the Recreational Trail Network and Interpretive Program, where youth restored traditional trails, built traditional dwellings (pit houses), and developed related interpretive signage (Sherry and Fondahl 2004).

3.2.2 Tl'azt'en Nation and the JPRF

The JPRF partnership has offered Tl'azt'en Nation significant benefits. The co-management agreement has increased Tl'azt'en Nation's control over a portion of their traditional territory, and community members have been able to develop skills related to co-management.

For instance, JPRF employs a small number of community members, and provides mentorship and training. Community-based research is also contributing to capacity building in the community, and aids Tl'azt'enne in documenting and preserving traditional knowledge, practices and values. Through partnership with UNBC, Chuntoh Education Society³¹ was established to increase educational attainment levels of community members, a major priority for Tl'azt'enne. Current challenges for the JPRF include regular board member attendance, and raising awareness of the JPRF and its activities among the partner communities (Grainger, Sherry, and Fondahl 2006).

The John Prince Research Forest is one example of Tl'azt'en Nation reasserting rights and responsibilities over its traditional territory (Fondahl and Atkinson 2007). Co-management offers much promise, although challenges exist in regards to achieving real power sharing, enhancing communication and understanding, ensuring local relevance, fostering long-term sustainability and promoting the amalgamation of diverse knowledge and value systems (Grainger, Sherry, and Fondahl 2006). Locally-relevant monitoring and evaluation mechanisms are needed to ensure co-management is effective for both. Community-based criteria and indicators show some promise as an adaptive management strategy for the John Prince Research Forest (Sherry *et al.* nd-a, nd-b, Grainger, Sherry, and Fondahl 2006). This thesis aims to expand the Criteria and Indicators framework to the measures level. Specifically, it focuses on cultural revitalization, an area of mutual concern for JPRF partners (Sherry *et al.* nd-a).

³¹ Chuntoh Education Society is a non-profit organization with charitable status that provides educational opportunities for local Aboriginal children.

4. Methodology

4.1 *Introduction*

In this thesis, a participatory method was developed to create measures of co-management success. The methodology employed here was chosen once a survey of candidate methods was complete, as described in Chapter 3, and after exploratory discussions with community research partners. Following this work, I was able to frame the work from a methodological perspective, describing the ontological approach, case study considerations, data quality factors, and community-based research requirements. Through this synthesis of information, it became clear that the optimal research method was a modified Nominal Group Technique (Delbecq, Van de Ven and Gustafson 1975) which fit both the community and the research questions. This chapter reviews the factors relating to the development of this approach and describes the method created through this thesis.

The methods chosen to address my research questions are grounded in pragmatism rather than academic theory (Creswell 1994), as the objectives address a current need in understanding forest co-management. The project also fits within the transformative-emancipatory paradigm (Creswell 1994) as it addresses needs and values of Aboriginal people, who currently have little opportunity to integrate their values into the use and management of forests. From a constructivist ontological perspective, the study recognizes that the work is context dependent, where reality is constructed by people (Guba and Lincoln 1989). Epistemologically, it is based in the thinking that there is no 'absolute truth'; rather, our understanding of reality is inherently value-laden, and researchers and evaluators can only recognize and minimize their own biases (Guba and Lincoln 1989).

4.1.1 Case Study Considerations

Case studies are a preferred research approach when asking 'how', 'what', or 'why' questions; when the investigator has little control over events; and when the focus is on a contemporary phenomenon within a 'real-life' context (Yin 1994). Alternative forms of investigation – experiment, survey, archival analysis or history – would not provide answers to these types of questions that are relevant and practical to people today (Yin 1994). Yin's (1994) description of the exploratory case study is best suited to my research question as I ask "how" ("how are Aboriginal measures best identified?") and "what" ("what are effective measures?" and "what are measures of co-management success?") questions, and I focus on contemporary events.

Tl'azt'en Nation was selected as the case study as it presents an excellent opportunity to conduct research with an Aboriginal community involved in a forest co-management partnership. Although other co-management regimes exist, there were no others identified that involve a First Nation in co-managing forest resources, that equitably share decision-making power, and that manage for community values as well as for profit. In addition, Tl'azt'en Nation and UNBC have developed a trusting relationship based on many years of research. Previous research with Tl'azt'en Nation and the John Prince Research Forest also offers insight and context to Tl'azt'en perspectives on sustainable resource management (see for example Booth 1998; Morris 1999b; Wilkerson and Baruah 2000; Karjala 2001; Kessler *et al.* 2001; Karjala and Dewhurst 2003; Karjala, Dewhurst, and Grainger 2003; Karjala, Sherry, and Dewhurst 2003; Sherry and Fondahl 2003; Karjala, Sherry, and Dewhurst 2004; Sherry and Fondahl 2004; Sherry *et al.* 2004; Sherry *et al.* 2005; Sherry, Karjala, and Dewhurst 2005). The recent establishment of the Tl'azt'en

Nation-UNBC Community University Research Alliance (CURA) further enhances the opportunity to engage Tl'azt'en Nation in this research.

Traditional biases of case studies are lack of rigor, unmanageable size, and little basis for generalization (Yin 1994). Rigor was addressed in the present study through strict use of qualitative techniques described below. I triangulated data by integrating previous research, conducting both interviews and focus groups, and by comparing findings to similar work done elsewhere. To ensure manageability, this case is geographically limited to the JPRF. The scope is further narrowed by limiting participation to the Tl'azt'en side of the partnership, focusing on cultural revitalization, and concentrating only on measures, excluding other C&I components such as targets or benchmarks and methods of data collection. To address generalizability, this study focused on generating a method for measures development. This method has potential to be used in a variety of cultural settings and resource contexts to increase the effectiveness and efficiency of co-management, as well as to enhance opportunities for participation, communication, and critical thinking. As Aboriginal peoples regain control over their resources, beyond forest co-management, it becomes increasingly important to develop culturally appropriate management and evaluation techniques. The methods developed in this thesis may be useful in evaluation of other areas of Aboriginal interest such as economic development, social work, health, education or research.

4.1.2 Ensuring Data Quality

Research design quality depends on construct validity,³² internal validity/credibility, external validity/transferability, and reliability/dependability (Guba and Lincoln 1989;

³² Guba and Lincoln (1989) actually argue against the use of construct validity in participatory evaluation; however, others, including Tashakkori and Teddlie (2003), disagree with their approach.

Tashakkori and Teddlie 2003). Construct validity addresses the question, “Does the study measure what it purports to measure?” (Tashakkori and Teddlie 2003). My research asks how participants feel success in cultural revitalization should be measured, and through my method, I ask this question of participants using a direct and open approach (i.e., the research does not involve deception or abstraction). Cross-cultural interviewing requires particular attention to communication (Ryen 2002). As a non-Aboriginal, middle class, female researcher from outside the community, there is a danger that I may have been less able to perceive certain subtleties, and that participants may have been reluctant to communicate honestly with me. Observation and assistance from the community research coordinator, Beverly John, aided communication. Working previously with the community, continuing to work as a CURA research coordinator, and reviewing First Nations literature also helped me to understand participants and to facilitate interviews appropriately. Framing participants’ understanding of who I am was critical (Ryen 2002). I attempted to establish a reputation in the community as a legitimate community-based researcher through activities such as assisting with other community-based research projects, writing articles for the CURA newsletter, and helping with community functions. This relationship building was enhanced by my working partnership with Beverly John. She provided insight throughout the entirety of the research project, and was particularly invaluable in providing insight on the cultural appropriateness of my methods, and promoting the value of my work in the community. Support and observation from the community researcher was critical to conducting valid research.

Internal validity is confirmed through the sequential process of data collection. The method described in this thesis includes techniques recommended by Guba and Lincoln (1989) for ensuring credibility: prolonged engagement with the community, peer debriefing, and

member checks. Peer debriefing occurred through reviews of the measures list by committee members and JPRF staff. Member checks³³ are integral to this research and were carried out through review of interview results by interview and focus group participants, and through a community poster presentation of final results.

External validity refers to the ability to generalize research findings, in that analytical generalization is meant to expand theory (Yin 1994). Measures resulting from the present study are not meant to be directly applied to other communities (i.e. the specific measures developed in this case cannot be used to gauge co-management success in other arrangements). The demonstrated effectiveness of the current approach is partly dependent on variable factors such as the participants, researchers, study design, and community. Externally applicable findings from this research relate primarily to the measures development process, which may be adapted for use in other cases. The literature suggests that there are many commonalities in successful measures development processes among indigenous communities around the world (as discussed on page 19).

Every effort has been made through research design to ensure reliability. For example, participant selection was accomplished previously through a rigorous, locally-based expert-selection process established prior to this study, removing the researchers' selection bias (Sherry *et al.* nd-b).³⁴ Interview questions were based on input from previous research with the same participants, helping to ensure that community perspectives are integral to the research design.

³³ "The member check, whereby data, analytic categories, interpretations, and conclusions are tested with members of those stake-holding groups from whom the data were originally collected, is the most crucial technique for establishing credibility. If the investigator is to be able to purport that his or her reconstructions are recognizable to audience members as adequate representations of their own (and multiple) realities, it is essential that they be given the opportunity to react to them" (Lincoln and Guba 1985, p 314).

³⁴ This is explained in detail in Section 4.2.2.1.

4.1.3 Community Contributions

As a community-based research endeavor, this thesis is committed to contributing to community goals, and producing locally relevant research outcomes (Kowalsky *et al.* 1996; Smith 1999). The *Tl'azt'en Nation Guidelines for Research in Tl'azt'en Territory*.³⁵ required that I make a variety of community contributions from and during my research. Remaining flexible and available, accepting requests for assistance with other community projects, and committing to provide multiple community benefits is of critical importance to the legitimacy of this research.

4.2 Measures Development Approach

To answer my research questions, I designed a multi-method, iterative approach to identify Tl'azt'en measures of co-management success related to cultural revitalization. The method borrows ideas from the Nominal Group Technique (Delbecq, Van de Ven, and Gustafson 1975), in that the design blends ideas from individuals, and shares them with a group. This study incorporates the five elements of Participatory Rural Appraisal: local people must be recognized as capable, outsiders need a relaxed rapport, data and analysis should be shared visually, complexity should be expressed (avoiding reductionism), and sequential methods should be applied (Chambers 1997). The process draws on the experience of similar processes that have produced successful research outcomes with Tl'azt'en Nation (Karjala and Dewhurst 2003; Karjala, Sherry, and Dewhurst 2004; Sherry and Fondahl 2004) and other Aboriginal communities (Parlee and Lutsel K'e First Nation 1997; Durie *et al.* 2002; Natcher and Hickey 2002a; Smyth 2002). An overview of my method is depicted in Figure 4.1. Each of the steps involved in the method developed for this thesis is described in detail in the following sections.

³⁵ Available at <http://cura.unbc.ca/gov> (accessed June 21, 2007)

Prior Research Required:

- *Participant selection through expert nominations, peer recommendations, and identification of significant local forest actors*
- *Identification of expected co-management outcomes through semi-structured interviews,*
- *Development of local-level C&I through group content analysis, framework analysis, and working group verification*

Step 1:

Personal Transformative Process

- **Gain experience, skills, trust and credibility** working in the community
- **Collect and review background information** on Aboriginal history, culture, and worldviews generally and locally, and co-management processes and outcomes
- **Learn about similar projects** on Aboriginal approaches to evaluation and measures development

Step 2:

Data Generation

- **Invite participants** who were previously involved in identification of expected co-management processes and outcomes
- **Select methods** for idea generation from available literature
- **Consider ethical issues,** and mitigate through adjusting research design elements
- **Design interview questions** based on expected co-management outcomes
- **Conduct interviews** on how participants would measure success in achieving identified values
- **Analyze** interview data
- **Draft a list of measures characteristics** based on literature, interviews, and local insights
- **Conduct focus group / workshop** to verify and supplement interview data, and adapt characteristics list
- **Analyze** focus group data

Step 3:

Measures Formation

- **Compile** data from the focus group, measures interviews, and outcomes interviews
- **Use measures characteristics list** as guidelines for structuring conversational ideas into discrete, succinct measures; reduce redundancies
- **Re-evaluate** the list through review by staff and technical experts, and assessment based on characteristics list
- **Finalize** and present to the community and co-management staff

Figure 4.1. Schematic of the methods for creating measures of cultural revitalization in the context of forest co-management.

4.2.1 Step 1: Personal Transformative Process

I first began working with Tl'azt'en Nation in October 2003, one year prior to beginning this study. An academic colleague and I were hired along with two community (Tl'azt'en) researchers, and we were trained in community-based research methodology, interviewing, and data analysis. In 2004, I was hired as a UNBC research coordinator on the Tl'azt'en Nation-UNBC Community-University Research Alliance (CURA), a position I filled throughout my thesis research. Working closely with the Tl'azt'en CURA research coordinator, Beverly John, and providing support to other Tl'azt'en researchers helped me gain perspective on community issues, priorities and values – a critical part of becoming a good community-based researcher. I also participated in a number of community events such as National Aboriginal Day festivities and an Elders' tea, visited staff in various administration offices, assisted with other community research projects, and participated in John Prince Research Forest functions.

Another factor critical in my development was reviewing articles about the history and culture of Tl'azt'en Nation, the Dakelh (Carrier) people, and other First Nations in Canada (see Chapters 2 and 3). Through coursework, I was exposed to a number of informative sources (see for example Brody 2000, 1981; Harris 2002), which enabled me to understand the context within which Tl'azt'enne struggle to regain rights to their traditional territory. Writings on Tl'azt'en Nation such as Hudson (1983), Kosek (1993), Morris (1999b), Karjala (2001), Brown (2002), and Karjala, Sherry and Dewhurst (2003) provided valuable context for developing an appropriate methodology and proposing research outcomes relevant to community goals. Finally, I explored Aboriginal approaches to resource management (Notzke 1995; Sherry and Myers 2002), including forest co-management (Beckley and Korber 1997; Chambers 1999; Treseder

and Krogman 2002) (see Chapter 2). I also reviewed related literature on Aboriginal participation in co-management of other natural resources (Osherenko 1988; Jentoft 1989; Berkes, George, and Preston 1991; Pinkerton 1992; Borrini-Feyerabend *et al.* 2000; Bickmore 2002). I sought out literature on Aboriginal-led monitoring and evaluation projects, including topics such as community health and well-being, social benefits from forest management, and success of educational programs (Parlee and Lutsel K'e First Nation 1997; Alzate 2000; Blauert and Quintanar 2000; Sidersky and Guijt 2000; Torres D. 2000; Parkins, Stedman, and Varghese 2001; Natcher and Hickey 2002a; Smyth 2002; Kotwal and Chandurkar 2003a; Karjala, Sherry, and Dewhurst 2004; Pokorny *et al.* 2004). A small number of projects from around the world describe participatory methods for developing measures (Merryfield 1985; Davis-Case 1989; Kirkhart 1995; Estrella *et al* 2000; LaFrance 2004; Symonette 2004).

4.2.2 Step 2: Data Generation

4.2.2.1 Participant Selection

Locally-identified experts from earlier stages of the CURA and preceding research were invited to participate in my research. These experts were originally selected through an expert nomination, peer recommendation, and significant forest actor identification process described in Sherry *et al.* (nd-b). In summary, an initial group of expert nominators (comprised of JPRF staff, Chuzghun Board of Directors, and JPRF Advisory Board) was asked to nominate people who were representative, were knowledgeable, had standing, and had a stake in or great potential to impact the JPRF (Sherry *et al.* nd-b). Those who received sufficient nominations were invited to participate, were informed of the process, and were asked to self-assess willingness to participate and to recommend other local experts (Sherry *et al.* nd-b). This process resulted in 16 Tl'azt'enne

being identified as local experts on the JPRF; these experts completed semi-structured interviews aimed at identifying the essential processes and outcomes of JPRF co-management (Sherry *et al.* nd-b). Based on their previous participation, they were invited to participate in my study.

4.2.2.2 Selection of Data Collection Methods

I reviewed a number of methods used to elicit information from research participants. Early in my research, I reviewed the Nominal Group Technique (Delbecq, Van de Ven, and Gustafson 1975), and decided to use the stages of the technique to provide an overall structure to the method developed in this thesis. The three stages of the Nominal Group Technique are: independent idea generation, group discussion, and independent reflection (Delbecq, Van de Ven, and Gustafson 1975). However, modifications were necessary as I felt that the rigidity of the approach, its reliance on written communication, and the requirement to rate ideas without discussion would not be appropriate for my research. I also believed that this method was better suited to dealing with less complex problems, and that multi-day idea generation sessions were needed for me to analyze information, adequately reflect on participants' ideas, and refine the measures concepts.

My previous experience with research in the community guided my decision to facilitate independent idea generation using semi-structured interviews. Single participant interviews allow for independent thought without influences from group interaction (Morgan 2002). Interviews were used successfully in previous research projects with Tl'azt'en Nation (Booth 1998; Morris 1999b; Karjala 2001; Sherry *et al.* nd-a). The one-on-one meetings also allowed me to become acquainted with each participant, to discuss measures concepts presented in an overview document (Appendix 1b), and to ensure each individual had the opportunity to understand the purpose of the project.

I chose to bring all interviewees together in a session that combined elements of a focus group and a workshop to further explain the project, to discuss the interview findings, to elaborate additional measures, and to determine Tl'azt'en perspectives on criteria of effective measures. Focus groups are group interviews that use interaction to generate data, and are generally used to "explore people's experiences, opinions, wishes and concerns" (Barbour and Kitzinger 1999, pg 5). Focus groups have emerged as a particularly useful method for applied social science research. In participatory action research, focus groups are often combined with workshops³⁶ to encourage capacity building in participants (Morgan 2002). Unfortunately, there is little critical writing on the use of focus groups combined with workshops. As well, use of focus groups in cross-cultural contexts has received little scrutiny (Morgan 2002). As the measures development process is somewhat complex, I expected that group interaction would facilitate understanding of the measures concept, and examples from other participants would help generate suitable ideas.

In the last stage, I synthesized pertinent information from previous research stages, reported the summary back to participants, and requested feedback. Prioritization seemed somewhat premature as further information seemed necessary for informed decision-making. This step replaces the voting stage of the Nominal Group Technique.

Another important factor in selection of idea generation methods was the amount of time and effort demanded of participants. This group included some of the most educated and technically skilled members of Tl'azt'en Nation; they are people in very high demand. As well,

³⁶ I use the term 'workshop' as Davis-Case (1989) uses 'group meeting'. Her definition is as follows: "A community group meeting generally involves a large number of people, but, if well designed, it can be participatory by encouraging two-way communication. Smaller focus group meetings can be even more participatory, as the information sharing may be more equitable when there are common problems and a common purpose, or when the group members are comfortable speaking to one another. The outputs from focus group meetings can be presented to larger group meetings, giving a "voice" to those in the community who are unable to speak up in a large group setting. (Davis-Case 1989; http://www.fao.org/DOCREP/006/T7838E/T7838E07.htm#P2119_124245)

participants already made significant contributions to the earlier stage of the project. I feared that fatigue could negatively affect project results. Therefore, every attempt was made to minimize the burden on participants while maintaining a community-based research approach. Thus, the interview topics were split amongst participants to reduce interview length, the focus group discussion focused mainly on one component of cultural revitalization, and the final verification stage was limited to written correspondence and open-house poster presentations (rather than subsequent interviews).

4.2.2.3 Ethical Considerations

As a university researcher, I was required to submit a research summary to UNBC's Research Ethics Board. As a CURA-funded student, I needed to adhere to the Government of Canada's *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans*, with particular focus on the section on *Research involving Aboriginal peoples*.³⁷ By involving Tl'azt'en Nation, it was also critical that I respected the *Tl'azt'en Nation Guidelines for Research in Tl'azt'en Territory*.³⁸ These guidelines present eight main topics: respect for Aboriginal knowledge, informed consent, collaboration, review and verification of results, community access to results, acknowledgement of participants, ownership of research results, and community benefit. I collaborated with a community researcher, hired and trained a Tl'azt'en post-secondary student, proposed research outcomes in line with community goals, acknowledged participants in all presentations of results (e.g., newsletter articles, posters, oral presentations, and this thesis), used a grounded and iterative research process, and integrating continual community feedback into project results. Prior to inviting participants, I received a

³⁷ <http://www.pre.ethics.gc.ca/english/policystatement/policystatement.cfm> (accessed June 21, 2007)

³⁸ Available at <http://cura.unbc.ca/gov> (accessed June 21, 2007)

formal permission to conduct research from Tl'azt'en Nation Chief and Council (through a Band Council Resolution, Appendix 4) and from UNBC's Ethics Review Board.

4.2.2.4 Interview Design

One purpose of the *C&I of Adaptive Forest Co-management*³⁹ project was to identify what outcomes or benefits Tl'azt'enne, UNBC, and other local stakeholders expect from the John Prince Research Forest (Sherry *et al.* 2005). Through grounded theory and framework analysis, 19 criteria and 86 indicators were identified, comprising ten environmental, social, economic and process themes. Using a group content analysis approach, analysts summarized each transcript by generating codes that united several people's thinking. Results were divided into three categories, including: processes, outcomes, and actions (Sherry *et al.* 2004). Code statements were grouped into Critical Local Values, which, in turn, were categorized into higher levels of organization (Figure 4.2). Analysis of the data indicated that the Tl'azt'en case showed unique examples in the area of social and cultural values expected from forest co-management in comparison to prevailing forest management C&I (Sherry *et al.* 2005). A particularly relevant topic for the John Prince Research Forest was the theme of cultural revitalization as it is part of its mandate; however, measures for the identified C&I were needed.

³⁹ The ultimate goal of the C&I study is to develop a bottom-up framework that can be used to direct, monitor, and evaluate co-management success, and to identify a process for doing so. This present work continues to move the study from value identification to program evaluation.

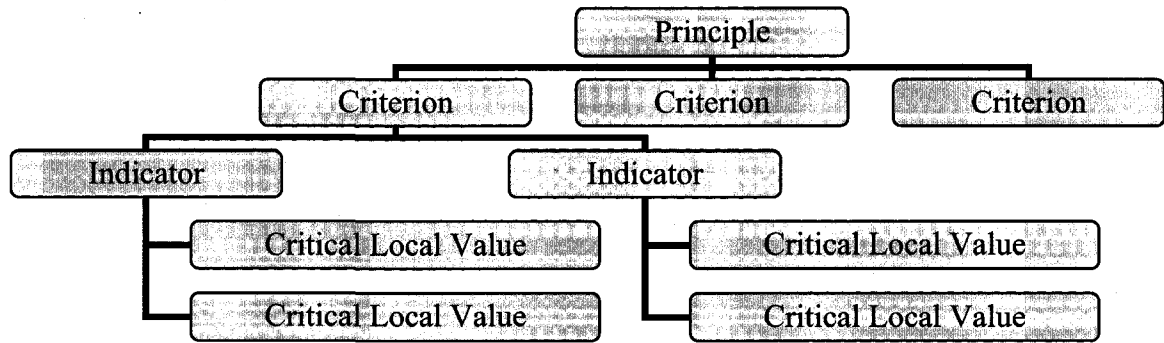


Figure 4.2. Structure of the JPRF C&I framework (Source: based on Sherry et al. nd-b)

I began with the principle, *Tl'azt'en Cultural Well-being*, and the respective criteria, indicators and critical local values. I then searched for other criteria and indicators within the overall framework that related to this principle. Two additional criteria related to education and to community health and well-being and five associated indicators were identified, as shown in Table 4.1. As the adaptive co-management C&I framework was intended to be presented as an interconnected whole, it was important to include those elements with close linkages to the principle, *Tl'azt'en Cultural Well-being*. It was also necessary to limit the study to themes that related exclusively to cultural revitalization outcomes, and not to specialized knowledge (e.g., knowledge of medicinal plants) or cultural values linked with spatial elements, such as traditional environmental knowledge or traditional land use activities. Table 4.1 shows the information from prior research that was used in this thesis. Beginning with previously-identified community values allowed me to focus on measurement and assessment of these values. Critical local values from relevant criteria and indicators were examined, and those Critical Local Values not directly related to cultural revitalization were removed (marked in Table 4.1 with an asterisk). Remaining Critical Local Values were grouped into four themes (labeled in Table 4.1 as A, B, C, and D), which were then adapted into questions; interview guides are provided in

Appendix 1. The questions concerned how the interviewee would assess JPRF success in achieving specific desired outcomes, which had been previously identified by the community. Additional questions were asked about general characteristics of a list of measures, and the participants' feelings about the interview's effectiveness.

Table 4.1. Unpublished interview data used in the present study from Sherry and Fondahl collected 2005/2006.

CRITERIA	INDICATORS	CRITICAL LOCAL VALUES⁴⁰
Respect and support Tl'azt'en Culture	Promote cultural revitalization	Increase pride in Tl'azt'en culture ^B Promote cultural identity and self esteem ^B Respect traditional forms of governance ^A Respect customary land managers ^A Promote respect for Tl'azt'en views and values ^C Involve <i>keyoh</i> holders ^{A, D} Involve Elders ^{A, D} Involve community members ^A Support the transmission of cultural knowledge and values ^C Organize traditional social activities ^C Facilitate the practice of traditional land use activities ^C
	Promote cultural rediscovery	Restore traditional trails ^C Conduct projects for First Nation children and youth ^{C, D} Offer recreational activities for First Nation children and youth ^{C, D} Offer traditional/cultural activities for First Nation children and youth ^{C, D} Foster intergenerational connections ^{B, D} Promote healthy living in Tl'azt'en children and youth*
Provide Diverse Education Opportunities	Provide cultural education opportunities	Develop and deliver cultural camps ^{C, D} Develop and deliver science/ culture camps ^{C, D} Teach traditional knowledge and land use ^{C, D} Teach Dakelh language ^{C, D} Facilitate cultural rediscovery for Tl'azt'enne through educational programs ^{C, D}
Contribute to Community Health and Well-being	Contribute to the quality of life in surrounding communities	Function as a gathering place ^C Function as a healing place ^C Build community pride ^B Promote community involvement ^A Improve community cohesiveness and unity ^B
	Provide programs that promote social well being	Youth programs ^{C, D} Women's programs ^{C, D} Family programs ^{C, D}
	Foster empowerment through the co-management experience	Cultivate a sense of worth and purpose ^B Encourage participation of local First Nations in regional issues ^B Promote a sense of pride and ownership ^B
	Contribute to community development*	Reinvest income in community development projects* Participate in local and regional activities* Attract attention and prestige for the partners* Improve local access to UNBC education and training opportunities* Improve local access to UNBC services and resources* Balance economic and community development* Provide benefits to diverse communities*

⁴⁰ Superscript letters refer to thematic categories used for developing interview questions. The asterisks (*) refer to Critical Local Values that were excluded from the study as they do not relate directly to Cultural Revitalization.

4.2.2.5 Pre-testing Measures Interviews

I pre-tested four interview guides by conducting trial-runs, audio-recording interviews with three Tl'azt'enne who were familiar with the JPRF, but who had not been nominated as participants: a male Elder, a female adult, and a male youth. I conducted the interviews under the observation of the Tl'azt'en CURA research coordinator. Interview locations were the workplaces of the interviewees. The questions concerned how the interviewee would assess JPRF success in achieving specific desired outcomes, which had been previously identified by the community. Additional questions were about general characteristics of a list of measures, and the participants' feelings about the interview's effectiveness. Further feedback was gained through debriefing with the Tl'azt'en CURA coordinator. As a result of this process, I decided to eliminate questions about general characteristics of a measures list; instead, this topic was explored with the focus group, and through observation and data analysis. There was some confusion regarding the use of previously collected information from Tl'azt'en Nation, but it was expected as these interviewees had not participated in previous C&I research, unlike our identified local experts. A number of small changes were made to the interview process: interview length was shortened due to the elimination of some questions, the background information was consolidated, the instructions were altered, and questions were simplified. Responses to pre-test interviews are not reported in the study.

4.2.2.6 Conducting Measures Interviews

Participants were contacted first by an invitation letter that explained the research project objectives, the benefits of participation, and the commitment level necessary to participate. They were then contacted by phone to confirm participation and schedule an interview. Background

materials were mailed to participants, including a summary of previous findings, a backgrounder on measures, and a set of interview questions. Of the sixteen Tl'azt'enne invited to participate, two declined and three could not be scheduled despite numerous attempts and a stated desire to participate; eleven Tl'azt'enne were interviewed. Three additional Tl'azt'enne joined the focus group, for a total of 14 participants. Ten participants were male, and four female. Three participants were under age 30, seven were age 30-45, and four were age 45-60. Approximately half of the participants had some post-secondary education. Many participants held positions of some authority in the community at some point in their careers, for example, managing an administrative department or holding a position on the Band Council.

I conducted single-participant interviews with the assistance of an experienced community researcher. Rather than asking all participants about all measures themes, the themes were broken down into four different question sets to reduce the interview length (Table 4.2). At the outset of each interview, written consent forms for the project were reviewed and signed; one interviewee opted to provide verbal consent. Interviews were approximately 12 minutes in length on average. Interviews were conducted in quiet offices spaces at the convenience of the participant. Probes were used to explore ideas brought up by participants. I tried to ensure participants were comfortable by establishing a good rapport and choosing a familiar, private interview setting. My cross-cultural communication skills were monitored by the Tl'azt'en CURA research coordinator, and no problems were identified. All interviews were recorded using a digital voice recorder. Participants were thanked and given a small gift.

Table 4.2. Interview themes and number of participants per theme.

Interview Guides	Number of participants invited	Number of interviews completed
A: Tl'azt'en management systems and perspectives	4	4
B: Community well-being	4	2
C: JPRF programs and activities	4	2
D: Tl'azt'en ways of teaching and learning	4	3

4.2.2.7 Measures Interview Analysis

Digital recordings of interviews on measures were played, and partial transcription was completed, which allowed me to efficiently identify relevant data. These transcripts were analyzed for ideas on measures, and notes were recorded on a spreadsheet. Although participants occasionally provided specific measures, more frequently they discussed concepts related to measurements of success, such as groups that should be consulted, possible sources of information, and further details on actions and desired outcomes. The nature of these interview results necessitated some changes to the method. Modifications included a shift in expectations for the focus group, a greater reliance on the list of measures characteristics, and an increased onus on the analyst to formulate the complete measures. Examples of ideas shared in the interviews are listed in Table 4.3.

4.2.2.8 Drafting Measures Characteristics

One objective of the focus group was to generate characteristics of Tl'azt'en measures. This was established by examining guidelines used in other measures development processes, reviewing literature on Aboriginal approaches to evaluation and empowerment evaluation, analyzing interviews, and drawing on my own observations and knowledge of the community. A draft list was reviewed by the Tl'azt'en CURA Coordinator, and my thesis committee and the JPRF manager. Revisions were made based on this feedback.

Table 4.3. Example of notes summarizing interview responses on selected topics.

Question	Components of Measures for JPRF	Other Comments
Language / place names	<p>Dakelh place names on JPRF maps</p> <p>JPRF should work with Elders/community members to identify place names.</p> <p>Use of Dakelh names for plants and trees</p> <p>Use of Dakelh and place names in education, including interpretive signs, herbarium, and "botanical garden"</p> <p>Use of Dakelh names for lakes, rivers, mountains and other landscape features</p> <p>Use of Dakelh and place names in education, including UNBC education and Tl'azt'en education</p> <p>Use of Dakelh words in naming JPRF organizations (e.g., Chuzghun RC, Chuntoh ed. soc.)</p> <p>Not all places have Dakelh names, so use of English ok</p> <p>Should use English words as well so people learn meanings</p> <p>Hearing Dakelh spoken (widely?)</p>	<p>Learn about Tl'azt'en history</p> <p>Create herbarium, botanical garden, interpretive signs</p>
Traditional Systems / Governance	<p>Education in schools about traditional governance systems</p> <p>Maps have <i>keyohs</i> on them with <i>keyoh</i> holders names</p> <p>Giving gifts in appreciation (e.g., interviews) - recognition of Balhats</p> <p>Recognizing Clan territories, acknowledgement of it</p> <p>Recognize traditional gender roles (e.g., women's role in guardianship of fishing sites)</p> <p>JPRF needs to acknowledge community more than just <i>keyoh</i> holders, include formal correspondence with Chief and Council.</p>	<p>Ask Tl'azt'en employees (e.g., Bev Leon (John) and Johnny Tom) about success</p> <p>Written progress reports. "Put it on paper"</p> <p>Distribute progress reports to members on both sides of partnership</p> <p>Use contemporary governance structure</p> <p>Need to revive traditional meaning of stewardship, where benefits were shared among community members and regulated activities and behaviors; benefits did not just go to <i>keyoh</i> family.</p> <p><i>Keyoh</i> holders should not feel a sense of ownership, rather guardianship on behalf of community.</p>

4.2.2.9 Focus Group Procedure

Those who had previously agreed to participate in interviews were again contacted through an invitation package, which was followed up by a telephone call. All invited participants expressed some interest in participating, although many would not commit to specific dates due to an overwhelming work schedule and high priority responsibilities such as legal and political negotiations. There were also issues relating to location of the focus group, as participants were located in Tache, Fort St. James, Prince George, and Vancouver. I had originally planned to conduct two or three focus groups, but considering significant scheduling challenges, I arranged only one session. An optimal date was set based on maximum availability of participants and necessary timelines for the research. In total, five of the invited participants attended, as well as three other Tl'azt'en Nation staff who had been invited by identified participants. Scheduling people's participation was accomplished in part through the assistance of the Tl'azt'en Nation Treaty Office. The focus group was held on Wednesday, November 15th, 2005, from 9:00 am to 12:00 pm. Digital audio and video recordings of the session were made.⁴¹

The main intention of the focus group was to verify and supplement interview data. I began the focus group with an introduction to the project, and oriented the group to the task. Since participant learning is important in community-driven measures development processes, we began the focus group with two example values, one simple and one more complex, and then brainstormed measures of success for the examples. After a short break, I began a running list of measures characteristics (as described on page 79), termed "Tl'azt'en Measures Guidelines" on a flip chart. I proposed characteristics of measures during the focus group/workshop based on

⁴¹ I had intended to review the video and conduct a participant observation of the group, however, the tape was lost by the Tl'azt'en Research Assistant who recorded the session and it could not be recovered despite multiple attempts by a number of people, until January 2007, after analysis had been completed.

findings from the literature and interview analysis; they were verified, changed and supplemented by participants.

For the main task, my questions to the group were based on evaluation of Cultural Revitalization, comprised of three themes. We began with the theme “Traditional Roles and Management Systems” and worked our way through five elements pertaining to that indicator. I distributed the results from the Measures Interviews to give participants an idea of what others had said, and to initiate discussion. I began taking notes on the flipchart myself, then the community researcher took over the task of recording suggested measures. This theme was the most complex of the three, and consumed most of our time. We had a chance to revisit the “Tl'azt'en Measures Guidelines”, and to quickly discuss community well-being and cultural education opportunities. Unfortunately, themes “Community Well-being” and “Cultural Education Opportunities” were not discussed in great detail, but I did confirm some questions I had regarding participants’ perspective on how to approach measurement of these two themes.

In an attempt to evaluate the measures development process, I asked participants about how they felt about the effectiveness of the focus group method for this task, using follow-up questions where appropriate. At the conclusion of the focus group, I thanked participants, gave them a gift, and provided lunch.

4.2.2.10 Focus Group Analysis

Information from the flip chart was copied into digital files. The audio file was reviewed for additional information that was used to add context to the notes. Results were combined with data from Stage 1 interviews, and source data were tracked. Characteristics of measures were proposed during the focus group based on literature and analysis; suggestions were incorporated during the session.

4.2.3 Step 3: Measures Formation

4.2.3.1 Measures Formation Procedure

At this stage, measures ideas had been suggested, but complete measures were not yet developed. I read through each code developed from the interview and focus group data, and added the detail necessary to make it a complete measure. For each code, I ensured there was an evaluative element, either qualitative or quantitative. When the idea was simple, a quantitative measure was developed. Examples of primary data are provided in Table 4.3.

Where necessary, I added a qualitative element to the measure, or created an entirely separate qualitative measure. With complex concepts, often only qualitative measures could be developed. In total, five types of measures were utilized: Presence/Absence (P/A), Quantitative (QUAN), Qualitative (QUAL), Qualitative/Quantitative, Opinion, and are described in Table 4.4.

I added a 'Preliminary Evaluation Key' to provide some direction on how the results of the measures should be interpreted. This was particularly important for the qualitative measures as they may be more difficult to assess. For example, the measure "Description of how JPRF distinguishes between trap lines and *keyohs*" can be assessed using the following guideline: "It may be necessary to distinguish between official trap line holders and traditional *keyoh* holders. These needs may shift as cultural revitalization progresses. Initiative should come from *keyoh* holders; JPRF should be responsive to community on this issue." The Preliminary Evaluation Key for each measure is presented in Appendix 2.

Table 4.4 The types of measures used in this thesis and their attributes.

Measure Type	Qualitative or Quantitative	Objective or Subjective
P/A	Quantitative	Objective
QUAN	Quantitative	Objective
QUAL	Qualitative	Objective
QUAN/QUAL	Both	Objective
OPIN	Both	Subjective

Preliminary results were reviewed by my advisory committee, the JPRF manager, and the Tl'azt'en CURA research coordinator. Feedback led to a substantial consolidation of the measures list by identifying similarities among measures and by screening measures based on the Tl'azt'en Measures Characteristics list. A number of preliminary measures were not strictly measuring the identified criterion (Cultural Revitalization). Other measures were improved by consulting the Tl'azt'en Measures Characteristics list, for example by rewording the measure to be more positive. This process produced a measures set ready to be verified by participants.

Results were distributed by mail and email to all participants for review and feedback. One additional attempt to reach each participant was made by telephone; however, minimal feedback was received.

4.2.3.2 Measures Structure

A total of 67 measures were derived through this study, and are presented in Appendix 2. Formulation of the measures and the preliminary evaluation key were derived through reviewing information from data collection procedures, and selecting a measure type that best suited the concept.

I structured each measure using the ideas expressed by participants and considering the Tl'azt'en Measures Characteristics, and then verified the adequacy of the set of measures within each theme. The type of measure selected depended on the attributes of each concept identified through interviews or the focus group (e.g., if it was abstract or tangible). A quantitative measure was developed if it could be done with validity. In terms of reliability, the optimal measure is quantitative (i.e., if the assessment were to be repeated, it is very likely an identical result would be found). For example, participants expressed that it was important for the JPRF to use both Dakelh and English place names on maps and signs. In this case, a clear quantitative measure (04) could be created without validity concerns, as shown in Table 4.5.

Table 4.5. Example measures from the final list of measures; the complete list is in Appendix 2.

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
04	Number and/or percentage of maps and signs produced by JPRF that are bilingual or primarily use Dakelh, by type	Increasing until 100%; must be original maps	QUAN	INT05 FG INT03	JPRF	Low	High	High
11	Satisfaction of Tl'azt'en JPRF BOD with how JPRF has worked with Elders	Should be culturally appropriate; should be generally satisfied; should have mainly positive comments and few to no negative comments	OPIN	FG	JPRF	Mod	High	Mod
15	Presence of JPRF policy stating that keyoh holders get first employment offers	Policy should exist; should find evidence that policy is in use	P/A	INT05	JPRF	Low	Mod	High
18	Description of how JPRF has worked with Elders	Should be consistent, culturally appropriate, meaningful, engage Elders in area of expertise; e.g., a list of Tl'azt'en Elders and their area of expertise or an active Elders Advisory Committee	QUAL	INT05 FG	JPRF	Mod	High	Mod
58	Opinion of Tl'azt'en Staff, Tl'azt'en BOD, Chief and Council on how JPRF contributes to cultural identity, cultural pride, and intergenerational connections	Should be generally satisfied; should have generally positive comments and few to no negative comments	OPIN	INT03	JPRF	High	High	Mod

Less easily measured concepts were also brought forward by participants. For example, ‘Culturally appropriate involvement of Elders’ was described as a critical element of co-management success. While counting the number of Elders involved in the JPRF would be a highly reliable measure, it would be invalid as it would not assess the cultural appropriateness of that involvement. In this case, two measures were used to get at this concept. Measures 11 and 18 (in Table 4.5), an opinion-based measure and a qualitative measure, were paired to determine the JPRF’s success in involving Elders. The qualitative measure allows the assessor to describe the JPRF’s efforts at working with Elders in a culturally appropriate way. The opinion-based measure allows for the subjective opinion of Tl’azt’enne to factor into the overall assessment. Opinion-based and qualitative measures are less reliable than quantitative measures, yet provide validity in some cases. I created pairs of measures for some topics to increase reliability though establishing dual information sources.

Measures for practices that occur fairly frequently but require slightly different responses, may be best suited with a presence/absence measure, provided there is sufficient trust in management. Presence or absence of policies or documents is a reliable measure; however, this can be less valid if the intent is to assess management actions (i.e., a policy is not necessarily a practice). This is also a useful type of measure as it requires very little effort to monitor, and can be used to verify the existence of previously established agreements. In this framework, measure 15 (in Table 4.5) was created as a presence/absence measure because an agreement currently exists for JPRF to make first employment offers to *keyoh* holders, and it is in practice. As well, *keyoh* holders are not necessarily qualified for many research-related or administrative positions at JPRF, so a quantitative measure could be complex and/or misleading (e.g., measuring the number of JPRF employees who are *keyoh* holders).

Each measure consists of a basic description, a preliminary evaluation key, and six attributes (type, source, focus, estimated monitoring difficulty, reliability, validity, and recommendation status). 'Type' is explained on page 83. 'Source' refers to the origin of the idea, which is usually from the data collection sessions, but occasionally from the analyst. 'Focus', 'monitoring effort', 'reliability', and 'validity' are assessed through analysis of the measure and evaluation key. 'Focus' refers to the organization or entity that is examined when evaluating the measure (includes Tl'azt'en Nation, JPRF, UNBC, and surrounding community). 'Monitoring effort' is a rough estimate of the time and resources required to complete the assessment of each measure, factoring in how data is to be collected or tracked and the source of that information. Data may be available from the JPRF office (low effort), or they may need to be collected through surveying the community (high effort). 'Reliability' or trustworthiness is defined as, "a given study's (or instrument's) consistency, predictability, dependability, stability and/or accuracy, and the establishment of reliability for a given study typically rests on replication" (Guba and Lincoln 1989, pg 235). All quantitative and presence/absence measures are rated as high in reliability, and all opinion-based measures are moderate. Qualitative and quantitative/qualitative measures were individually assessed as their reliability varies depending on the source of subjective information. 'Validity' refers to the how closely the measures correspond to cultural revitalization (i.e., the strength of the evidence). For example, some presence/absence measures are moderate in validity (e.g., 15 in Table 4.5) as they may or may not address work or results in practice. While these measures may be reliable and objective, they may be less valid as they do not address the cultural revitalization directly.

Measures were designated recommended or potential, similar to the process followed by Wright *et al.* (2002). For each measure, the six attributes (type, source, focus, monitoring effort,

reliability, and validity) were considered. Recommended measures are ready to be worked into a monitoring plan in their current form. Potential measures are less viable due to a combination of factors, including high amount of required effort, moderate validity, and or/moderate reliability. A more detailed explanation of the attributes is provided in Appendix 2.

5. Results

The three related objectives of this research were: 1) to develop, implement and evaluate a process for generating locally-defined measures of co-management success; 2) to identify measures of co-management success from an Aboriginal perspective; and 3) to delineate characteristics of effective Aboriginal measures. The following presents results related to each of the above goals, beginning with the second objective.

5.1 Tl'azt'en Measures of JPRF Co-management Success in Cultural Revitalization

This thesis produced a list of measures for evaluating co-management success with respect to cultural revitalization, an outcome identified as important to (and by) the co-management partners. The list of measures was created for use by Tl'azt'en Nation and the John Prince Research Forest, and should not be generalized beyond this case. However, the themes can provide insight into the range and depth of cultural revitalization efforts and results that a community might expect from co-management.

It is also important to recognize that the focus of these results is exclusively on cultural revitalization, which refers only to the continuance of traditional aspects of Tl'azt'en culture. Although some participants discussed the importance of contemporary social matters to the community (e.g., respecting contemporary Tl'azt'en governance), that was beyond the scope of this study. It should be noted that omitting these concepts from this study was not reflective of JPRF or community priorities; rather, it was my decision made in the interests of managing the size and extent of this study. Measures produced in this thesis are presented in this section (Tables 5.2-5.7).

Sixty-seven measures were generated and from them six themes emerged (Table 5.1).

The findings demonstrate a number of new measures for marking progress towards cultural revitalization. A review of the measures within each theme helps to explain what the community expects of the JPRF. For the use of Dakelh language and place names, measures include oral and written use of language and place names within the JPRF (Table 5.2). These concepts are fairly easily measured; thus, few measures are necessary to achieve a clear understanding of the state of these values.

Table 5.1. Overview of the themes produced in the present study.

▪ Using Dakelh language and place names
▪ Respecting traditional roles and governance systems
▪ Supporting traditional cultural activities
▪ Using research to revitalize traditional culture
▪ Using education to revitalize traditional culture
▪ Condition of cultural revitalization

Table 5.2. Resulting measures in the theme, ‘Using Dakelh language and place names’.

▪ Satisfaction of Tl'azt'en JPRF staff about JPRF's use of Dakelh
▪ Number and/or percentage of JPRF staff who speak basic Dakelh
▪ Number and/or percentage of JPRF staff who speak Dakelh fluently
▪ Number and/or percentage of maps and signs produced by JPRF that are bilingual or primarily use Dakelh, by type
▪ Number and/or percentage of maps and signs produced by JPRF that are partially bilingual
▪ Percentage of JPRF events where Dakelh was used
▪ Percentage of JPRF organizations with Dakelh names

Under the theme, ‘Respecting traditional roles and governance systems’, measures include respect for, involvement of, and satisfaction of *keyoh* holders; and, understanding and restoration of traditional governance systems and practices (Table 5.3). Many measures in this theme assess the extent to which the JPRF respects the *keyoh* holders whose territories fall within its boundaries (Table 5.3). Tl'azt'enne see co-management as an opportunity to revitalize the role

of the *keyoh* holder as stewards of their traditional lands (Table 5.3). Participants also considered that monitoring how JPRF works with Elders was important, as they are keepers of valuable Dakelh knowledge (Table 5.3). Beyond these points, the role of the JPRF in restoring traditional governance systems is less clear; therefore, measures based on satisfaction were also created which are more general (Table 5.3).

Table 5.3. Resulting measures in the theme, ‘Respecting traditional roles and governance systems’.

▪ Satisfaction of <i>keyoh</i> holders on JPRF's approach to consultation and information sharing
▪ Satisfaction of <i>keyoh</i> holders with JPRF land-based projects
▪ Satisfaction of Tl'azt'en BOD members and <i>keyoh</i> holders with how <i>keyoh</i> holders are acknowledged by JPRF
▪ Satisfaction of Tl'azt'en JPRF BOD with how JPRF has worked with Elders
▪ Satisfaction of Tl'azt'en JPRF BOD with methods used to involve <i>keyoh</i> holders in JPRF co-management
▪ Satisfaction of Tl'azt'en JPRF staff with its opportunities to incorporate culture into the workplace
▪ Presence of a mutually agreed-upon JPRF policy for sharing benefits with <i>keyoh</i> holders
▪ Presence of JPRF policy stating that <i>keyoh</i> holders get first employment offers
▪ Presence of maps in JPRF office delineating <i>keyohs</i> , with <i>keyoh</i> holders labeled
▪ Description of how JPRF distinguishes between trap lines and <i>keyohs</i>
▪ Description of how JPRF has worked with Elders
▪ Description of methods used by JPRF to involve <i>keyoh</i> holders and their families
▪ Satisfaction of Tl'azt'en BOD with land stewardship opportunities on the JPRF
▪ Presence of a JPRF policy to encourage gifts to be given to acknowledge contributions where appropriate (as in balhats)
▪ Ability of JPRF staff to describe traditional governance systems
▪ Description of how JPRF supports Tl'azt'en governance restoration efforts

Tl'azt'enne are actively involved in many cultural revitalization pursuits, and JPRF is expected to support these efforts where possible. Tl'azt'enne expect JPRF staff to participate in various Tl'azt'en-led cultural revitalization initiatives and to provide facilities for cultural activities, such as community access to the Cinnabar Resort and restored traditional trails on the JPRF land base (Table 5.4).

Table 5.4. Resulting measures in the theme, 'Supporting traditional cultural activities'.

▪ Satisfaction of Tl'azt'en BOD with JPRF cultural opportunities
▪ Description of how JPRF supports cultural eco-tourism for Tl'azt'enne
▪ Description of how JPRF supports Tl'azt'enne in practicing traditional land use activities
▪ List of JPRF facilities and supplies for cultural activities
▪ Amount of JPRF support for Tl'azt'en Nation's cultural initiatives
▪ Length of restored traditional trails on the JPRF
▪ Number of Tl'azt'enne who have visited JPRF (Cinnabar) for camping, by age group
▪ Number and description of opportunities for Tl'azt'enne to participate in JPRF activities and projects of cultural importance
▪ Number and list of community cultural functions that JPRF staff has participated in, by type of function
▪ Number and list of external cultural events held on the JPRF
▪ Level of interest of Tl'azt'enne about JPRF cultural programs
▪ Satisfaction of JPRF trail building crew with traditional trail restoration projects

The JPRF is uncommon as a co-managed forest in its mandates for research and education. These objectives are reflected in community expectations for the JPRF to use research and education to revitalize Tl'azt'en traditional culture (Table 5.5). The extent, impact, benefits, and accessibility of research and findings should be measured, as should the amount of research on cultural knowledge (Table 5.5). Tl'azt'enne expect the JPRF to facilitate and conduct research that promotes community interests and respects Tl'azt'en protocols (Table 5.5). As many different research outcomes may be beneficial, measures are used to describe the extent of, type of, and satisfaction with the research conducted (Table 5.5). Others assess adherence to community standards for research practices (Table 5.5).

Table 5.5. Resulting measures in the theme, ‘Using research to revitalize traditional culture’.

▪ Presence of a policy that requires all JPRF documentation of Elders’ knowledge to be shared with Tl’azt’en Nation
▪ Description of how JPRF research has benefited cultural revitalization for Tl’azt’en Nation
▪ Amount of money raised or provided by JPRF for research on traditional Tl’azt’en culture
▪ Number of Elders' stories that have been documented by JPRF research
▪ Percentage of JPRF projects where original recordings, transcriptions and/or reports are provided to Tl’azt’en Nation
▪ Number and description of JPRF research projects on topics of cultural importance
▪ Number and description of JPRF research projects that include recording and documentation of Dakelh language
▪ Number and description of reports on Tl’azt’en culture, history, and/or people produced by JPRF research
▪ Satisfaction of participants with JPRF research projects on traditional culture, by project
▪ Percentage of Elders' stories documented by JPRF that are attributed to an Elder

Education delivery is also a specific mandate for the JPRF, and some management-focused measures were created on this topic. Measures on the JPRF’s educational aims focus on cultural curriculum and skills development, learning opportunities, sharing knowledge about Tl’azt’en culture, and program quality (Table 5.6). Recommended measures examine the perspectives of program participants, as well as learning opportunities and program content (Table 5.6). A final skills assessment of participants following programs would make the success of the program clear; however, this may require more effort than is reasonable for the JPRF (Table 5.6).

Table 5.6. Resulting measures in the theme, ‘Using education to revitalize traditional culture’.

▪ Number of schools involved in JPRF programs on traditional culture
▪ Number of students involved in JPRF programs on traditional culture, by age group
▪ Amount and description of JPRF curriculum and materials on traditional culture, by topic
▪ Number and description of cultural skills delivered to participants through JPRF programs
▪ Number and description of JPRF learning opportunities on traditional culture, by type
▪ Awareness of Tl'azt'enne about JPRF education programs on traditional culture
▪ Opinion of instructors and curriculum writers on the quality of JPRF programs on traditional culture, by program
▪ Satisfaction of instructors with skills attained by participants of JPRF programs on traditional culture, by program
▪ Satisfaction of participants with JPRF education programs on traditional culture, by program
▪ Number and description of traditional cultural skills successfully developed in participants through JPRF programs, by program

The six themes represented in these findings speak primarily to community views on the role of JPRF co-management, but also to the participants’ vision for their community. Themes one to five contain measures that are mainly focused on the JPRF, the original aim of this study. However, participants also encouraged the exploration of community-focused measures, thus theme six, “Condition of Cultural Revitalization” is comprised mainly of these interests. As community-focused measures found in these themes require further research, theme six in particular should be considered incomplete. It contains measures that focus beyond JPRF co-management, focusing directly on results and conditions (Table 5.7). The theme ‘Cultural revitalization results’ includes general measures of the cultural well-being in the community and in the JPRF, the level of traditional cultural skills amongst Tl’azt’enne, the level of employment that relates to traditional culture, and legal recognition of Aboriginal place names (Table 5.7). While many insisted that JPRF should not be held responsible for conditions within the community, others believed the concept to be a necessary component for understanding co-management success. Due to the limited exploration of community-focused measures, the majority of the measures may require further research before implementation (see measures designated as ‘Potential’ in Appendix 2). One topic addressed in this theme is the satisfaction of

Tl'azt'enne (including co-management board members) with JPRF contributions to less tangible factors related to cultural revitalization, such as cultural pride and identity. Another component examined in this theme is sharing of traditional culture with others and increasing awareness of traditional culture. Participants indicated that monitoring needs to include assessments of the community capacity in traditional knowledge and skills, as well as their application and practice including paid positions. Hodder and Sherry (2005) include a traditional skills assessment in their community capacity inventory, which informed formation of these measures.

Table 5.7. Resulting measures in the theme, 'Condition of cultural revitalization'.

▪ Number of groups from UNBC who hear Dakelh language spoken on Tl'azt'en traditional territory
▪ Number and list of UNBC courses where students learn about Tl'azt'en Nation (e.g., culture, history, knowledge systems, etc.)
▪ Opinion of Tl'azt'en Staff, Tl'azt'en BOD, Chief and Council on how JPRF contributes to cultural identity, cultural pride, and intergenerational connections
▪ Opinion of Tl'azt'en youth about the importance of education on traditional culture and language
▪ Opinion of Tl'azt'enne on the level of cultural identity, cultural pride, and intergenerational connections in the community
▪ Satisfaction of Tl'azt'en BOD members with how Tl'azt'en culture is part of JPRF
▪ Description of how local/regional schools deliver education regarding traditional governance systems
▪ Number of jobs in the community that require cultural skills
▪ Number of place names within Tl'azt'en territory that have been legally changed to Dakelh
▪ Percent of Tl'azt'enne who have Dakelh language skills, by skill type and by age group
▪ Percent of Tl'azt'enne who have traditional use skills, by skill type
▪ Ratio of employed Dakelh translators to total number of translators in Tl'azt'en Nation

5.2 Measures Characteristics and Evaluation

This section reviews the measures characteristics identified by this research, compares the characteristics to those used in other monitoring programs and evaluation literature, and highlights areas of non-correspondence. Due to a paucity of literature on the characteristics of Aboriginal measures of co-management success, literature was reviewed pertaining to participatory monitoring and evaluation, SFM monitoring, and general research methodology.

Comparison measures characteristics were identified from a variety of sources (Guba and Lincoln 1989; Parlee and Lutsel K'e First Nation 1997; von Mirbach 2000b; Parkins, Stedman, and Varghese 2001; Rallis and Rossman 2003; LaFrance 2004; Lincoln and Guba 2004; Symonette 2004; Fetterman and Wandersman 2005; LaFrance 2005). Reviewed literature showed a wide variety in measures structure and effectiveness criteria. The characteristics of effective Tl'azt'en measures identified through this research are presented in Table 5.8. Three main categories of characteristics emerged from the data, and relate to the overall measurement approach, wording of measures, and the quality of measures. Within these categories, ten specific characteristics are identified.

Table 5.8. The characteristics of effective Tl'azt'en measures.

<i>Measurement Approach</i>	Apply an Empowerment Methodology
	Utilize Subjective and Objective Measures
	Assess Management Efforts and Community Conditions
	Take a Mixed Methods (Qualitative/Quantitative) Approach
<i>Measure Wording</i>	Measures Should Have a Positive Focus
	Measures Should Build Capacity through Wording
<i>Data Quality</i>	Measurement Validity
	Trustworthiness
	Sensitivity to Change
	Practicality

The four characteristics included in 'Measurement Approach' provide guidance as to what types of measures should be included in a Tl'azt'en measures set. The first characteristic in the category, 'Empowerment Methodology' requires that measures be developed collaboratively with the community, and the project must provide diverse benefits related to empowerment. The second characteristic, 'Subjective/Objective Measures' explains that measures must include

opinion-based measures to ensure cultural appropriateness and local relevance, but also objective measures to increase trustworthiness. Next, 'Management/Community Orientation' insists that measures assess community expectations for co-management, whether they measure aspects of the co-management institution or the community partner. Finally, 'Qualitative/Quantitative Approach' means that a combination of qualitative (descriptive) and quantitative (number) measures should be used.

Suggestions on the wording of measures aid in optimizing the structure of the measures. The characteristic 'Positive Focus' explains that measures should have a positive focus, looking at what should increase, rather than what should decrease. For example, a preferable measure of access to traditional food would be 'number of people with access to traditional foods', in comparison to 'number of people without access to traditional foods'. The second characteristic relating to measure wording 'Capacity Building', suggests that technical terminology should be used in measures as appropriate, but it should be accompanied by laypersons' terminology to help build community capacity.

The final category contains criteria for assessing the quality of each individual measure. First, 'Validity' should be used to assess the quality of each measure. Validity is used in this sense to ensure the measure is clearly linked to the identified value (i.e., the associated criterion and indicator). Second, 'Trustworthiness' or reliability must be ensured. Measures have to be reliable so that we can be confident in the data; this includes attention to credibility, dependability, and confirmability. Third, 'Sensitivity' is important to detect change over time; the measure must be at the appropriate level of detail to achieve this. Finally, 'Practicality' must be considered because implementation of the measure must be realistic. Thus, the scale and

scope of the measure must be considered in the context of the resources required for collecting the necessary information.

The effectiveness of the method developed in this thesis depends upon how closely the resulting measures correspond with the Tl'azt'en measures characteristics. The results in this section quantitatively evaluate the measures set against the Tl'azt'en measures characteristics where possible.

5.2.1 Measurement Approach

5.2.1.1 Apply an Empowerment Methodology

Resulting Characteristic

I first proposed “involvement of Tl'azt'enne” as a characteristic, since the need for community participation was evident in the literature and was emphasized in the measures interviews and outcomes interviews.⁴² Outcomes interview analysis revealed that participants considered the involvement of Elders, *keyoh* holders, and community members as critical to successful co-management. Participation was then put forth to the focus group as a component of a successful co-management evaluation program. This seemed to be understated, as Tl'azt'enne felt that they should not only be involved in evaluation, but they emphasized that the measures development process should be community-driven, rooted in community values, and resulting in benefits for the community. This characteristic was then modified to incorporate these key concepts as follows: measures must be developed through an empowerment methodology, where

⁴² Outcomes interviews were conducted with Tl'azt'en participants prior to this study, and the questions focused on what outcomes Tl'azt'enne would like to see from JPRF co-management.

community members are an integral part of the evaluation process (including measures development), and the process leads to multiple community benefits.

Result of the Method

The method design corresponds to the principles of Empowerment Evaluation (Fetterman and Wandersman 2005). The principles include improvement in the organization, community ownership, inclusion, democratic participation, social justice, community knowledge, evidence based strategies, capacity building, organizational learning and accountability. The measures development process completed through this thesis has equipped JPRF staff to initiate a rigorous self-evaluation system based on community values, knowledge and perspectives. The process focuses on utility, providing an organizational learning mechanism for continual improvement and internal accountability. It is motivated by social justice, utilizing a methodology which addresses democratic participation and inclusion. The measures have been developed in a way that channels local knowledge using the experience gained elsewhere in measures development. Diverse capacity building strategies were undertaken, though further efforts are needed. Community ownership was balanced between John Prince Research Forest staff and Tl'azt'en research participants.

5.2.1.2 Utilize Subjective and Objective Measures

Resulting Characteristic

Based on ideas from First Nations monitoring and evaluation literature and some Forest Stewardship Council (FSC) examples, I proposed the use of opinion-based measures. While participants agreed, they stressed that a balance with objective measures was key. To include local perspectives, the resultant measure set must include subjective measures that communicate

the opinions of Tl'azt'enne, which must be combined with objective measures to strengthen the trustworthiness of the measures for each theme. Through interaction with Tl'azt'enne, I came to see the importance of this measure type. Participants recommended these measures during the measures interviews; subsequently, these ideas were supported by the focus group. They suggested that to determine the success of the JPRF, Tl'azt'enne involved in JPRF programs and management activities should be consulted on their opinions, provided the opinions are supplemented with objective information. For example, one participant recommended, "Employees can tell community members if things are working well, based on their own observations, and if they put it on paper."⁴³

Result of the Method

As shown in Figure 5.1, this method was successful in ensuring a balance of subjective and objective measures for the overall measures set, and for each theme. Generally, objective measures are more reliable and informative; thus they comprise the majority of the measures set. As subjective measures provide an important balance to the assessment of each theme, a minimum of one subjective measure per theme was ensured.

⁴³ Interview with a Tl'azt'en community member in Tache, June 30th, 2005

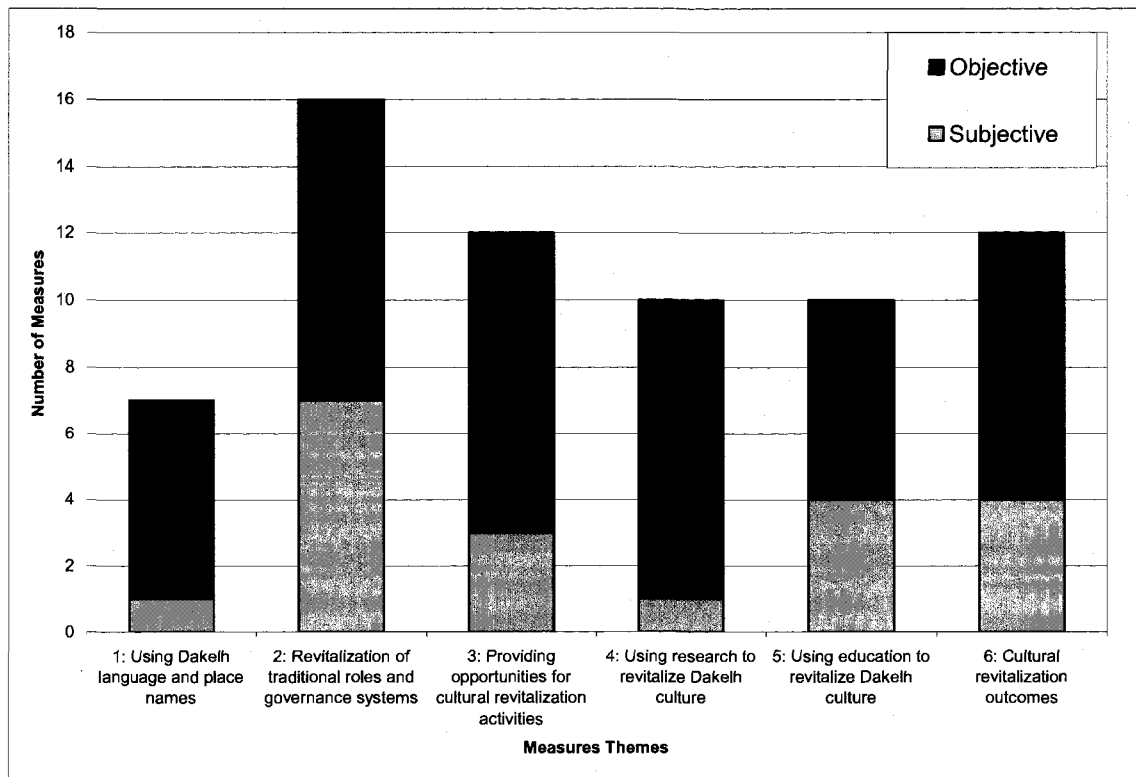


Figure 5.1. Number of subjective and objective measures by measure theme.

5.2.1.3 Assess Management Efforts and Community Conditions

Resulting Characteristic

Originally, I proposed that measures need to link directly to JPRF co-management; however, this idea was challenged during the focus group. I did this in an attempt to restrict the scope of the project, and because it was also recommended through the management-focused evaluation literature. Tl'azt'enne explained that their measures of success should include measures that examine aspects of co-management (management-focused measures) *and* measures that report on community realities (community-focused measures). They explained that

co-management participants should make their best efforts to manage for desired community outcomes, although they realized that change may be difficult to achieve.

Result of the Method

The method was successful in producing both management- and community-focused measures, although community-focused measures are somewhat under-represented. Of the measures created in this project, 85% assess JPRF conditions or management. The remaining 15% are community-focused measures that assess conditions of other groups.

The relationship between JPRF success and community conditions has yet to be defined. While some participants insisted that community conditions should be considered in a JPRF evaluation, others felt uncomfortable placing such a responsibility upon the research forest. All community-focused measures are within the theme, 'Condition of Cultural Revitalization'.

5.2.1.4 Take a Mixed-Methods (Qualitative/Quantitative) Approach

Resulting Characteristic

Aboriginal focused literature points out the importance of qualitative measures, as does research in program evaluation. I proposed that the inclusion of qualitative measures be a necessary characteristic; however, research participants believed it was important that a Tl'azt'en measures set includes both qualitative and quantitative measures. Participants explained that while quantitative measures are important to get a quick assessment of current conditions, the qualitative measures help provide context necessary to understand how and why conditions exist. Thus, ensuring a balance of qualitative and quantitative measures is desirable for evaluating JPRF co-management.

Result of the Method

Measures were either qualitative, quantitative, or mixed-methods measures with both qualitative and quantitative aspects. These types of measures are fairly evenly distributed across categories with a balance of qualitative and quantitative measures in each theme, as depicted in Figure 5.2.

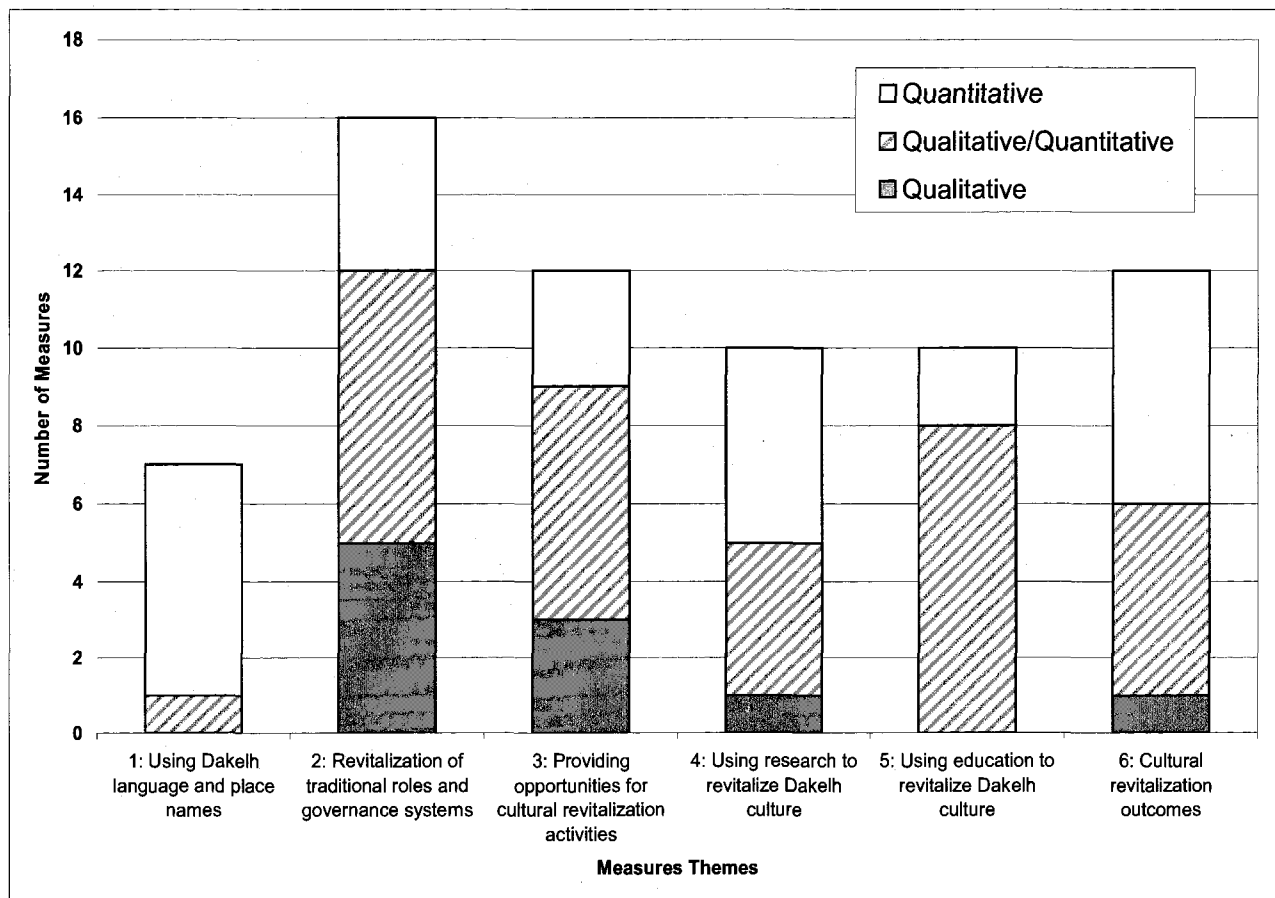


Figure 5.2. The number of measures by type, by measure theme.

The content of each measure theme influenced the proportion of quantitative to qualitative. For example, ‘Use of Dakelh place names and language’ lent itself to quantitative assessment much more than other themes. Use of language is tangible, straightforward, and is fairly easily assessed through objective, quantitative measures. Conversely, ‘Revitalizing

Traditional Roles and Governance Systems' is more complex: while this could be measured quantitatively, that measure may not delve deep enough into the concept of participation, raising questions of validity (e.g., *keyoh* holders may attend board meetings, but they may not feel adequately represented).

5.2.2 Measure Wording

The 'wording' category was not one under consideration during the focus group as it could not be identified in the literature. Instead, the idea arose from participants. From my observations on the general orientation of Tl'azt'en participants and from a specific suggestion made during the focus group, two characteristics emerged to form the 'Wording' category. The category generally refers to the structure of the measures statements, and demonstrates how even wording is a critical factor in measures formation.

5.2.2.1 Measures Should Have a Positive Focus

Resulting Characteristic

Tl'azt'enne have often emphasized to me the importance of having a positive outlook. Although the community faces many challenges, Tl'azt'enne participating in this study suggested that it is important to focus on the encouraging aspects of their community and to build on them for the future. As one participant explained, "[We] want positive news to work with one another, not negative... That's how to move forward."⁴⁴ Since measures are designed to provide the basis for information gathering endeavors, through the wording of the measure, there is an opportunity to phrase measures as community goals, rather than community problems. Thus, measures

⁴⁴ Interview with a Tl'azt'en community member in Tache, June 30th, 2005

phrasing should reflect the positive Tl'azt'en outlook. For example, the unemployment rate is a common economic measure, whereas the Tl'azt'en approach would suggest using measures of employment. This does not exclude the reporting of negative results on a measures (e.g., a decrease in Tl'azt'en employment). Through analysis of the data, I consistently found that participants recommended measures in line with community aspirations and not in negative terms.

Result of the Method

This approach was fully successful in utilizing positive wording. In my first round of data transformation, I found that all ideas had been expressed in a positive manner, and there was no reason to create any measures with a negative focus; thus all quantitative measures have positive trends as targets. This finding further reinforces the appropriateness of this criterion of Tl'azt'en measures.

5.2.2.2 Measures Should Build Capacity through Wording

Resulting Characteristic

The measure proposed to the focus group was termed 'understandable', as it is prevalent in the literature. While clarity was important, Tl'azt'enne expressed that it was equally important not to over-simplify or 'dumb down' measures or eliminate technical measures based on a lack of certain skills among community members. Instead, Tl'azt'enne saw the use of technical measures as an opportunity for community learning. Tl'azt'en measures should utilize and explain complex concepts, where applicable, by accompanying the technical terminology with lay-persons' language.

Result of the Method

Technical terminology was not used in the measures developed for cultural revitalization. Technical concepts were not recommended by participants to measures cultural revitalization, thus there was no opportunity to build capacity in this way. This guideline may be useful in future measures projects for the *C&I of Adaptive Forest Co-management* project, particularly those utilizing environmental measures.

5.2.3 Data Quality

Characteristics in this theme were all based on concepts found in the literature. The meanings behind each of the characteristics were largely based on the impressions of community members, and used terminology from the program evaluation literature, particularly that focused on Aboriginal and empowerment contexts. Measure quality cannot be determined without examination of measures results. The results related to these characteristics are based on my speculation of the potential for achieving the characteristics based on the methodology. Estimates of validity, trustworthiness, and effort are given for the overall set of measures.

5.2.3.1 Measurement Validity

Resulting Characteristic

In terms of evaluation, validity means that a measure truly assesses what it is intended to measure (Guba and Lincoln 1989). The focus group agreed that this seemed like a logical criteria for evaluating measures, and concurred with this description. Tl'azt'en measures should be valid from community members' perspectives, and must stem from identified local expectations of the John Prince Research Forest. This characteristic does not depend on outside judgements of

validity, for example, those who may feel that community conditions are not linked to JPRF success. In essence, Tl'azt'enne must perceive that measures assess the community value that they are designed to measure.

Result of the Method

Validity was estimated by assessing how closely the measure corresponds to the value it is intended to measure. I judged that high validity has a direct and obvious link (e.g., assesses an element of the value), moderate validity has a slightly weaker link (e.g., presence or absence of a policy), and 'linked' does not have a direct link to JPRF, but participants identified a JPRF linkage (e.g., number of legally established Dakelh place-names).

I estimated that 48 (72%) of the measures have high validity, 7 (10%) have moderate validity, and 12 (18%) had 'linked' validity. Of the seven measures with moderate validity, four are presence/absence measures which were included due to their low monitoring difficulty rating. Two were specifically recommended by participants and were thus included (but designated as potential), and the final measure was the only measure in the theme that was quantitative and provides information inclusive of the theme (i.e., rather than a specific element of the theme). 'Linked' validity was challenging to assess, because I did not determine the linkage: it was established by research participants. These measures are all within the theme "Cultural revitalization outcomes" and are community-focused.

5.2.3.2 Trustworthiness

Resulting Characteristic

Originally, this characteristic was presented as 'reliability', as this is the term most commonly used in academic and forest management literature. The focus group accepted the

idea once the concept was explained, but the term was not immediately understandable. After further exploration of the literature, I exchanged ‘reliability’ with ‘trustworthiness’ as it is a more transparent term that corresponds more closely with the definition: for measures to be effective, Tl’azt’enne must judge the measures results to be trustworthy and believable.

Tl’azt’enne participating in the current research were concerned with reliability, but believed this characteristic should be used to improve subjective and qualitative measures, not to exclude them. For example, when collecting data on measures it is preferable to choose respondents who do not have a vested personal interest in positive findings over those who do (e.g., a measure of an instructor’s satisfaction with curriculum delivery verses a student’s or an administrator’s opinion).

Result of the Method

Analysis of trustworthiness at the measure level relates to the measure characteristics: opinion-based and qualitative or mixed-methods measures were designated as ‘moderate’, while objective, quantitative measures were ‘high’. The reliability of the measures set is approximately evenly split between ‘high’ (48%) and ‘moderate’ (52%). The highly trustworthy measures are fairly evenly distributed across themes (Appendix 3), with the exception of Theme 2, “Revitalization of traditional roles and governance systems”. I found this theme extremely difficult to quantify as specific interests are not well-defined in this topic, and information depends highly on opinion-based measures of satisfaction. The use of qualitative and/or subjective measures reduces reliability in the conventional sense from the position of the evaluator; however, a future assessment based on Tl’azt’en perspectives may prove that subjective measures are as trustworthy as objective measures. An estimate of trustworthiness at the thematic level is based on the diversity of measure types within a theme. All themes contain

at least one objective and one subjective measure, and qualitative and quantitative elements (Figures 5.1 and 5.2).

5.2.3.3 Practicality

Resulting Characteristic

I recommended the ‘practical’ characteristic to participants to ensure that measures can be realistically implemented, as was common in many other monitoring programs reviewed in the literature. This was accepted by the focus group with little need for discussion as it was clearly understood and easily acceptable for participants.

Result of the Method

I estimated the monitoring effort by considering the amount of time and resources that might be required to collect the information. ‘Low’ effort would require less than 30 minutes to assess and would require examination of files or knowledge internal to the JPRF. ‘Moderate’ effort requires more than low effort, but can be completed within one day’s work. It requires data collection activities outside the JPRF office, might involve interviews with individual or small groups, or requires fairly intensive internal assessments, including record keeping. ‘High’ effort requires multi-day data collection, perhaps including surveys of many individuals, archival or document analysis, detailed record keeping, and/or complex survey questions. The majority of the measures (42%) require low effort, while 36% require moderate effort and 22% require high effort.

To make the measures list easier for JPRF to implement, I separated measures into two tiers: recommended and potential (Appendix 3). Measures were recommended only if they were rated as moderate to low for burden of assessment. Measures with a high burden of assessment

were designated as potential rather than being eliminated on the basis of measurement difficulty. Theme 6, “Well-being of traditional culture”, contains measures that focus on the community (rather than the JPRF) and are difficult to measure; therefore all measures in this theme are rated as potential. Measures were also designated as potential if they assess small details that are not major contributors to the condition of traditional culture in the community, and may or may not be important to the community as a whole.

5.2.3.4 Sensitivity to Change

Resulting Characteristic

Many measures frameworks have used ‘sensitivity to change’ as a criterion; however, after reviewing various descriptions and applications of sensitivity, I found them difficult to use as a characteristic for selecting or screening measures at this stage because sensitivity seems to be indeterminable prior to long-term field-testing. For this reason, I did not originally propose sensitivity as a criterion; rather, I included when defining measures to participants, and made it clear that the goal of the project was to monitor change over time. It is included here as a characteristic to emphasize that sensitivity was a consideration in this process, and is it was used through the selection and implementation of the method rather than as a screening criterion.

Result of the Method

It cannot be determined at this time if the measures will result in data that is sensitive to change. The method was designed to utilize local-level expertise; thus measure sensitivity is an expected result. Risk of a lack of sensitivity is mitigated through the use of multiple measures per theme. Future work could evaluate the sensitivity of each measure and improve or eliminate insensitive measures.

5.3 *Method Evaluation*

The third objective of this thesis is to evaluate the method that was developed. I evaluate the method using information related to characteristics and participation of Tl'azt'enne who were involved in the method, and using feedback received from the focus group on the success of the method.

5.3.1 Participant Group Composition, Attrition, and Response Rates

Participation varied among the various data generation procedures (Table 5.9). The interviews conducted prior to this study (Sherry and Fondahl 2004) included community members with a broad range of characteristics. Participants included Tl'azt'en Nation employees, Tl'azt'en Nation Chief and Council, JPRF staff and board members, natural resources management practitioners, political interests, Keyoh holders on the JPRF, Elders, and general Tl'azt'en community members (Table 5.9). Sherry and Fondahl (2004) completed a significant forest actor analysis to ensure all important groups within the community were represented by interview participants.

Table 5.9. Background of research participants at the time of their participation, and their extent of participation in the present study. Those in the light gray boxes were only invited to participate in the Focus Group. Those in the dark gray boxes did not participate in the present study; however, their information from previous research was included.

Name	Invitations	Acceptance	Participation	Gender	Age	Background at Time of Participation
Beverly John	Interview 2003	Yes	Yes	F	30-45	JPRF employee, CURA Research Coordinator, post-secondary education
	Interview 2005	Yes	Yes			
	Focus Group	Yes	Yes			
Amelia Stark	Interview 2003	Yes	Yes	F	30-45	Tl'azt'en Nation Education employee, Education Director, Tl'azt'en Nation Councilor, former JPRF Board Member, CURA Steering Committee member, post-secondary diploma (economic development)
	Interview 2005	Yes	Yes			
	Focus Group	Yes	Yes			
Beverly Bird	Interview 2003	Yes	Yes	F	45-60	Tl'azt'en Nation Treaty Office employee, Director of Research and Development, former board member for the JPRF, CURA Steering Committee member, university graduate
	Interview 2005	Yes	Yes			
	Focus Group	Yes	Yes			
Johnny Tom	Interview 2003	Yes	Yes	M	30-45	JPRF employee, Forest Technician, Keyoh Holder on the JPRF, Forest Technologist Diploma
	Interview 2005	Yes	Yes			
	Focus Group	Yes	NO			
Alex Pierre	Interview 2003	Yes	Yes	M	30-45	Forest Technician, Tanizul Timber employee, Forest Technologist Diploma
	Interview 2005	Yes	Yes			
	Focus Group	Yes	NO			
Ron Winser	Interview 2003	Yes	Yes	M	30-45	Environmental Monitor, Tl'azt'en Nation Natural Resources Office employee, former JPRF employee
	Interview 2005	Yes	Yes			
	Focus Group	Yes	NO			
Thomas Pierre	Interview 2003	Yes	Yes	M	45-70	Carrier Sekani Tribal Council employee, Economic Development, Forestry, former Manager of Tanizul Timber, Forest Technologist Diploma
	Interview 2005	Yes	Yes			
	Focus Group	Yes	NO			
Dwayne Martin	Interview 2003	Yes	Yes	M	30-45	Forestry Technician, Tl'azt'en Nation Natural Resources Office, former Research Assistant, former JPRF Board Member
	Interview 2005	Yes	Yes			
	Focus Group	Yes	Yes			
Danny Alexis	Interview 2003	Yes	Yes	M	>60	Retired, former Chief of Tl'azt'en Nation, former JPRF Board Member
	Interview 2005	Yes	Yes			

Name	Invitations	Acceptance	Participation	Gender	Age	Background at Time of Participation
	Focus Group	Yes	Yes			
William Pierre	Interview 2003	Yes	Yes	M	45-60	Community School Bus Operator, Tl'azt'en Nation employee
	Interview 2005	Yes	Yes			
	Focus Group	Yes	NO			
Tyler Pierre	Interview 2003	Yes	Yes	M	30-45	Aboriginal Liaison Officer, Ministry of Forests employee, Forest Technologist Diploma
	Interview 2005	Yes	Yes			
	Focus Group	Yes	NO			
Jonathan Tom	Focus Group	Yes	Yes	M	<30	Keyoh Holder on the JPRF, Youth
Phyllis Joseph	Focus Group	Yes	Yes	F	<30	Treaty Office Research Assistant, Youth
Nathan Seymour	Focus Group	Yes	Yes	M	<30	CURA Research Assistant, Youth
Harry Pierre	Interview 2003	Yes	Yes	M	>60	Former Tribal Chief of Carrier Sekani Tribal Council, former Chief of Tl'azt'en Nation, Elder, Keyoh Holder on the JPRF
	Interview 2005	Yes	NO			
	Focus Group	Yes	NO			
Ed John	Interview 2003	Yes	Yes	M	45-60	First Nations Leadership Council Member, Tl'azt'en Nation Grand Chief, First Nations Summit Task Group Member, Former Carrier Sekani Tribal Council Tribal Chief, former Tl'azt'en Nation Chief, former board member for JPRF and Tamizul Timber, Lawyer
	Interview 2005	Yes	NO			
	Focus Group	Yes	NO			
Tommy Alexis	Interview 2003	Yes	Yes	M	45-60	Tl'azt'en Nation Chief, JPRF Board Member
	Interview 2005	Yes	NO			
	Focus Group	Yes	NO			
Clarence Pierre	Interview 2003	Yes	Yes	M	30-45	Tl'azt'en Nation Councillor
	Interview 2005	NO	NO			
	Focus Group	NO	NO			
Philip Felix	Interview 2003	Yes	Yes	M	>60	Elder
	Interview 2005	NO	NO			
	Focus Group	NO	NO			

For the measures interviews conducted in this study, 11 people of the 16 invited were interviewed, for a response rate of 69% (Table 5.9). Three of the invitees who were not interviewed had agreed to participate (Chief Thomas Alexis, Tribal Chief Harry Pierre, and Grand Chief Ed John), but I was unable to successfully schedule an interview time, resulting in an attrition rate of 19%. The main difference in composition of this group to the previous is the lack of Elders (Table 5.7). Tl'azt'en Council members, Tl'azt'en Nation Treaty Office staff, and an employee of the Carrier Sekani Tribal Council were interviewed (Table 5.9).

The focus group had fewer participants, with only five of the original 11 participating for a response rate of 45% (Table 5.7). As this low response was anticipated, three youth were invited who, while not originally identified by Sherry and Fondahl (2004), were recommended by the Tl'azt'en Treaty Office. This second round of invitations resulted in a revised response rate of 57%.

Invitations to the interviews and focus group were done together, so similarly, 14 agreed to participate (Table 5.9). The attrition rate was 64% (9/14) from the original acceptance of the invitation. After the second round of invitations, the attrition rate was 53% (9/17). While response rates declined, the group remained as representative of the community as the measures interview participants. The group included youth, Tl'azt'en Nation employees, a former chief, a current councillor, researchers, a Keyoh holder, a JPRF staff member, former members of the JPRF Board of Directors, natural resource professionals, and Treaty Office staff (Table 5.9). As with the measures interviews, all age groups but the 'Over 60' category were represented (Table 5.9).

5.3.2 Productivity of Data Generation Procedures

There were three distinct idea generation procedures: the interviews on expected JPRF outcomes from 2003 (INT 03), the interviews on measures of success from 2005 (INT 05), and the focus group/workshop on measures of success (FG). I supplemented the set with measures based on my own observations (Analyst). These ideas were compiled into a table, and similar ideas were combined into measures, while origins were tracked (e.g., 'INT05; INT03'). Figure 5.3 shows the number of measures ideas originating from each combination of data generation sources.

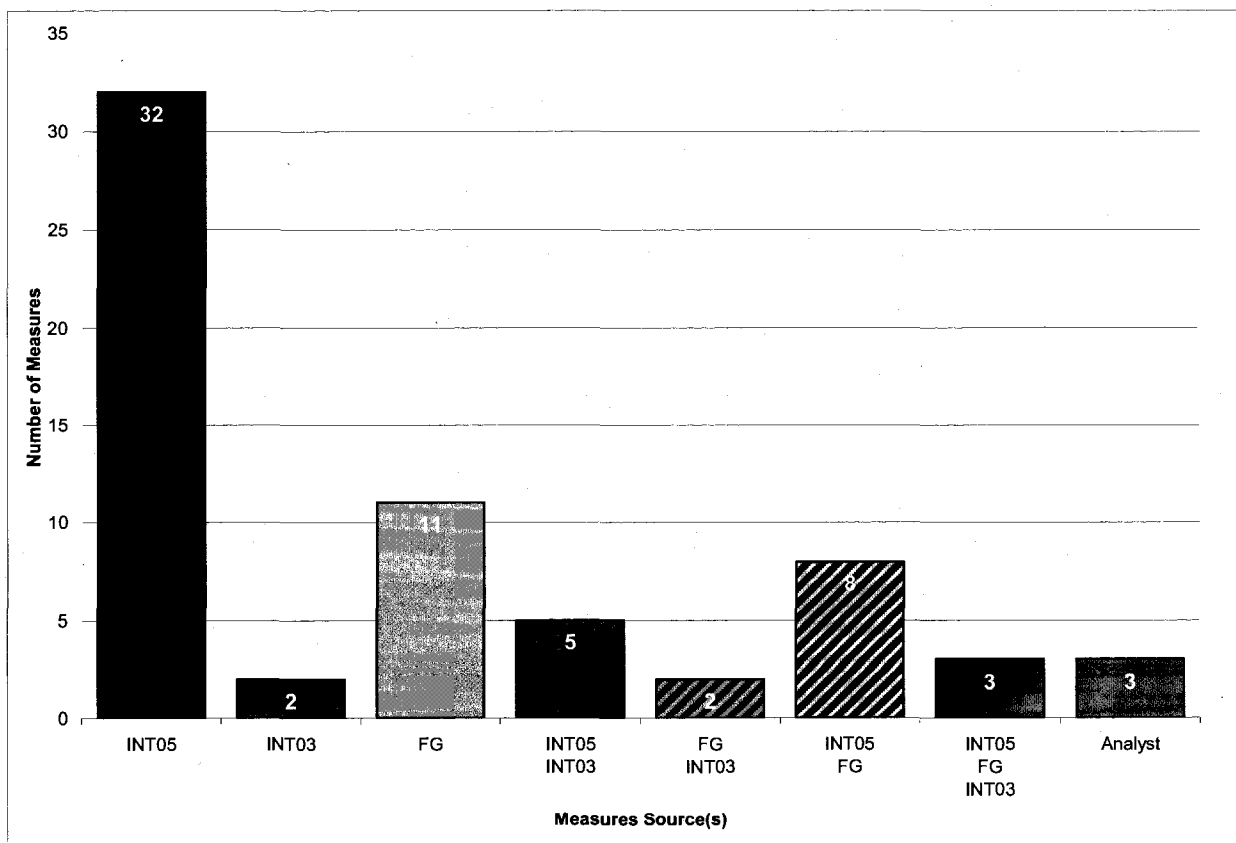


Figure 5.3. Ideas from the various combinations of measures sources resulted in a total of 67 measures.

By far, the richest source of measures information was the measures interviews (INT05), which resulted in 32 unique measures, and when combined with information from other

sources⁴⁵, contributed to a total of 48 measures (Table 5.7). This data generation procedure was the most productive in terms of the number of measures created. For the approximately 90 minutes of focus group (FG) discussion, only 11 measures from single sources and 13 measures from multiple sources were produced (see Figure 5.3). Despite the volume of data analyzed for the outcomes measures (INT03), only 12 measures resulted, and only two of those were from single sources.⁴⁶ I added three final measures to the list (Analyst) with assistance from community researchers.

For the focus group, the contribution to the measures set was greatest in terms of unique emphases rather than quantity (Figure 5.4). Of the 10 community-focused measures, seven originated from the focus group (FG) due to the focus verification completed in the session. Measures from the measures interviews (INT05) were almost exclusively management-focused (94% for unique measures, and 100% for combined ones).

⁴⁵ For example, sometimes identical or similar ideas were produced from the different sessions (Int05, Int03, FG). Resultant measures then had to be attributed to multiple sources.

⁴⁶ This finding is interesting as the purpose of these interviews was not measures development, and they incidentally yielded twelve measures.

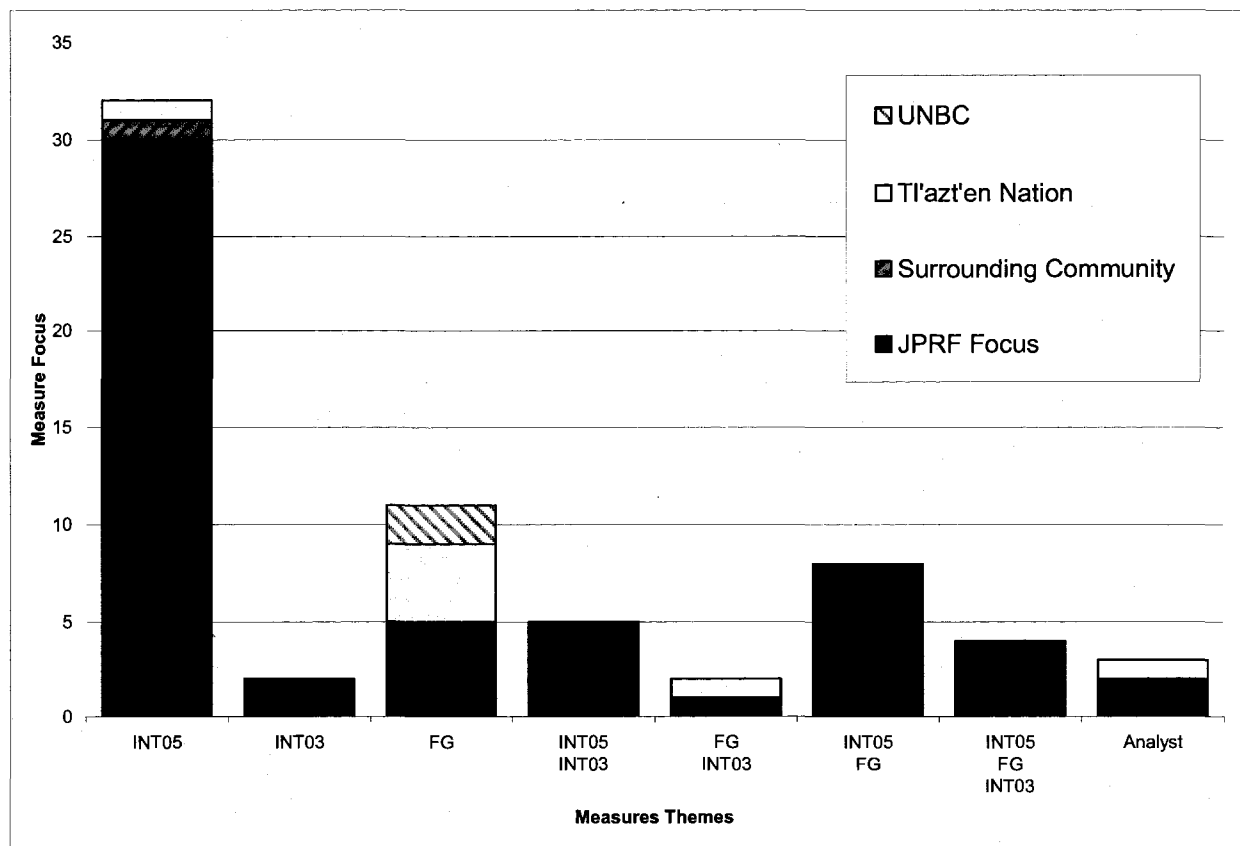


Figure 5.4. Focus of the measures by data source.

5.3.3 Participant Evaluation

Overall, the response from the focus group was very positive. Several constructive comments were received. A summary of the feedback is reported in Table 5.10. Specific questions were posed to the group, and a general discussion followed.

Table 5.10. Feedback from Focus Group participants on the success of the method as the end of the focus group.

Topic	Response from Participants
Interest	Great to get caught up on where the research project is at, good to get a background. Recommendation to present this information at other venues.
Measures Concept	Appreciate discussing in the context of measures of success, rather than just discussing issues.
Need for Measures Interviews	Yes, you need both the interviews and the focus group. Group discussion was helpful for understanding, and for hearing other people's opinions, and the focus group was much more in depth.
Clarity	Themes seem very interconnected – not clear distinction between categories. Difficult to read interview summaries at the same time as discussing issues. Should more closely review the interview information, and use it to structure the focus group. Good not to make a forced reading time, but just review verbally, and ask participants to review the summary. Interview information appeared to be fine, but little opportunity to review in depth.
Size of Focus Group	Response that group size is ok with eight people. One participant commented earlier that the group could be split in two.
Representation at the Focus Group	Comment that not all who were invited were in attendance. Discussion concluded that it was ok that not everyone came. It was important to invite all the 16 people who were interviewed. Because language was a topic, it would have been good to have someone like Margaret [a language expert] involved.
Length of Focus Group (3 hours)	Response was that length was ok. I noted that people were starting to get tired.
Location	Good – all agreed
Pace	"It all worked out", "it was good"

6. Discussion

The results of this thesis are discussed in the context of the literature in this chapter. Like Chapter 5, this chapter is organized according to the three thesis objectives, which relate to the Tl'azt'en measures identified for the JPRF, the criteria for effective measures, and the method evaluation. The measures developed in this thesis are compared to those developed through other processes, for varying purposes. The thesis results relating to the characteristics of effective measures are discussed with reference to screening criteria used in similar projects, to concepts of culturally competent evaluation, and to principles used to evaluate the quality and rigor of qualitative and quantitative research. Discussion of the method evaluation involves a comparison of the process developed in the thesis to others used to develop measures. Modifications are recommended for future applications of the method.

6.1 Tl'azt'en Measures of JPRF Co-management Success in Cultural Revitalization

The measures in this study are comparable to those developed in other monitoring programs, in part because they examine similar values. Through an extensive literature search, I identified twenty-one frameworks that had some correspondence to the themes derived from this study as presented in Chapter 5. These were designed for three different monitoring purposes: (1) Aboriginal values in natural resources management, (2) Sustainable Forest Management (SFM), and (3) community health and well-being (Table 6.1). Monitoring for the first purpose includes those that are focused on co-management, or schemes designed to assess the extent of Aboriginal values being met in natural resources management. SFM monitoring includes national programs such as the model forests' local level indicator initiative, and locally applied certification

standards from the Forest Stewardship Council (FSC) and Canadian Standards Association (CSA). Measures within these studies that pertain to cultural revitalization were also identified (Table 6.2). Each of these studies presents measures to be used in monitoring, with the exception of the report by Sherry *et al.* (2005), which includes “Critical Tl'azt'en Values” to compare against other monitoring frameworks.

Table 6.1. An overview of studies used to compare with this study.

Author (year)	Project Title & Description
<i>Aboriginal Values in Natural Resources Management</i>	
Alzate (2000)	<i>'Monitoring and Evaluating Local Development through Community Participation: The Experience of the Association of Indigenous Cabildos of Northern Cauca, Colombia'</i> : a participatory evaluation undertaken by a non-profit community development organization
Blauert and Quintanar (2000)	<i>'Seeking Local Indicators: Participatory Stakeholder Evaluations of Farmer-to-Farmer Projects, Mexico'</i> : a project to determine how to evaluate extension activities.
Sidersky and Guijt (2000)	<i>'Experimenting with Participatory Monitoring in North-east Brazil: The case of AS-PTA's Projeto Paraíba'</i> : an indicator development project designed to improve monitoring and evaluation of an agricultural extension organization.
Karjala (2001)	<i>'Integrating Aboriginal Values Into Strategic-Level Forest Planning on the John Prince Research Forest, Central Interior, British Columbia'</i> : a master's thesis that developed community-based criteria and indicators of forest co-management
Natcher and Hickey (2002a, 2002b)	<i>'Putting the Community Back into Community-Based Resource Management: A Criteria and Indicators Approach to Sustainability'</i> and <i>'A Criteria and Indicators Approach to Community Development. Report for the Sustainable Forest Management Network'</i> : a participatory indicator development project focused on forest co-management in northern Alberta.
Smyth (2002)	<i>'Indicating Culture'</i> : a study of local Aboriginal values for the Wet Tropics World Heritage Area to be used for monitoring and improving park management
Kotwal and Chandurkar (2003a, 2003b)	<i>'Operational Model of Adaptive Co-management of Indian Forests Based on Criteria and Indicators'</i> and <i>'Indigenous Measures of Sustainability: Developing Local-Level Criteria and Indicators'</i> : an approach aiming to combine top-down and bottom-up approaches to local level C&I creation.
Sherry <i>et al.</i> (2005)	<i>'Local-Level Criteria and Indicators: An Aboriginal Perspective on Sustainable Forest Management'</i> : a case study of Tl'azt'en Nation co-management values identified through archival analysis and designed to compare bottom-up C&I to prevailing C&I frameworks
<i>Sustainable Forest Management</i>	
Prabhu <i>et al.</i> (1996)	<i>'Testing Criteria and Indicators for the Sustainable Management of Forests: Phase 1 Final Report'</i> : a project that developed measures based on four international case studies where they adapted a generic template established by the Centre for International Forest Research (CIFOR).

Author (year)	Project Title & Description
von Mirbach (2000b)	<i>'A User's Guide to Local Level Indicators of Sustainable Forest Management: Experiences from the Canadian Model Forest Network'</i> : a collection of local level indicators from Model Forests nation-wide, which are based on the Canadian Council of Forest Ministers' C&I.
Peachey (2002)	<i>'A Catalogue and Analysis of Forest Stewardship Council Regional Standards for Principle #3, Indigenous Peoples' Rights'</i> : a collection of measures from various regional standards for FSC C&I.
Wright <i>et al.</i> (2002)	<i>'Monitoring for Forest Management Unit Scale Sustainability: The Local Unit Criteria and Indicators Development (LUCID) Test'</i> : a C&I template prepared for the USDA Forest Service, based on Montreal Process C&I.
FSC Canada (2004)	<i>'Forest Stewardship Council National Boreal Standard'</i> : a report that includes all FSC C&I to the measures level, which is intended for use in the boreal regions of Canada outside of BC.
Pokorny <i>et al.</i> (2004)	<i>'Local Stakeholders' Participation in Developing Criteria and Indicators for Sustainable Forest Management'</i> : a process where forest managers, government workers, academics and indigenous people evaluated SFM criteria, indicators and measures using pre-identified attributes.
Anon. (2005)	<i>'Monitoring SFM Values in the Fort Nelson Defined Forest Area: Development of a Monitoring Program, the Fort Nelson SFM Plan'</i> : a plan prepared for British Columbia Timber Sales and Canadian Forest Products based on the Land and Resource Management Plan, and it also meets Canadian Standards Association requirements.
Boyd (2005)	<i>'Monitoring Rationale for Values under the SFM Framework; Criterion 8: Sustaining First Nations Values (Quesnel Defined Forest Area)'</i> : a rationale developed locally, but designed to address Canadian Standards Association requirements.
FSC Canada (2005)	<i>'Preliminary Forest Stewardship Council British Columbia Regional Standard'</i> : a project that covers some preliminary work on measures for FSC C&I in a British Columbian context.
Community Health and Well-being / Sustainability	
Parlee and Lutsel K'e First Nation (1997)	<i>'Community Based Monitoring. Annual Report 1996/97'</i> : a report intended for community health monitoring by the Lutsel K'e Dene community in the Northwest Territories, within the context of upcoming mineral development.
Baruah (1998); Wilkerson and Baruah (2000)	<i>'Sustainable Development of Rural Aboriginal Communities of Northern British Columbia: a Case Study of the Tl'azt'en Nation'</i> : this was intended to be used by the community for strategic planning and sustainability progress.
Parkins, Stedman and Varghese (2001); Parkins, Varghese and Stedman (2001)	<i>'Moving Towards Local-Level Indicators of Community Sustainability in Forest-Based Communities'</i> and <i>'Locally Defined Indicators of Community Sustainability in the Prince Albert Model Forest'</i> : two reports on a study led by university and Model Forest researchers, which examined three communities' perspectives (one of which was an Aboriginal community) on community sustainability.
(Durie <i>et al.</i> 2002)	<i>'Māori Specific Outcomes and Indicators'</i> : a framework that was developed for the New Zealand Ministry of Māori Development and looks at well-being of the Māori at all scales (down to the program level).
(Waitakere City Council 2004)	<i>'Waitakere City Wellbeing Report'</i> , includes a section on Māori well-being based on the Treaty of Waitangi in New Zealand.

Table 6.2. Brief description of all identified measures development studies.

Study	Location	Level of Detail	Management Context	Monitoring Focus	Participants	Can Compare to Thesis?
Parlee and Lutsel K'e First Nation 1997	Northwest Territories, Canada	Measures	Community Sustainability	Community Health	Community leadership	Yes
Baruah 1998; Wilkerson and Baruah 2000	Northern British Columbia, Canada	Measures	Community Sustainability	Community Well-Being and Services	Academics and Community	Yes
Alzate 2000	Colombia	Measures (sample only)	International Development (Farming)	Multiple Community Values	NGOs, local farmers	No (sample measures only)
Blauert and Quintanar 2000	Oaxaca, Mexico	Indicators	International Development (Farming Extension)	Multiple Community Values	NGOs, local farmers	Yes
Sidersky and Guijt 2000	Paratiba, Brazil	Measures	International Development (Seed banks)	Community Development	NGOs, local farmers	No (sample measures only)
von Mirbach (2000b)	Locations across Canada	Measures	Sustainable Forest Management	Environmental, Economic, and Social	Scientific Experts	Yes
Karjala 2001	Northern British Columbia, Canada	Indicators	Forest Co-management (JPRF)	Multiple Aboriginal Values	Co-management partners	No (due to level of detail)
Parkins, Stedman, and Varghese 2001; Parkins, Varghese, and Stedman 2001	Saskatchewan, Canada	Measures	Community Sustainability	Social Values (includes a First Nation)	Community leadership	Yes
Durie <i>et al.</i> 2002	New Zealand	Indicators	Māori Well-Being	Community Conditions	Government	Yes
Smyth 2002, 2005	Queensland, Australia	Measures	Protected Areas Management	Aboriginal Cultural Values	Park managers, community leadership	Yes
Natcher and Hickey 2002a; 2002b	Northern Alberta, Canada	Measures	Forest Co-management	Aboriginal Environmental Values	Co-management partners	No (no similar themes)

Study	Location	Level of Detail	Management Context	Monitoring Focus	Participants	Can Compare to Thesis?
Peachey 2002	Across Canada	Measures	Sustainable Forest Management	Indigenous Peoples' Rights	Scientific Experts	Yes
Wright <i>et al.</i> 2002	Locations across the USA	Measures	Sustainable Forest Management	Environmental, Economic, and Social Values	Scientific Experts	Yes
Kotwal and Chandurkar 2003a	Bhopal, India	Results not reported	Forest Co-management	Multiple Forest Values	Co-management partners	No (results not reported)
FSC Canada 2004	Across Canada (boreal forest)	Measures	Sustainable Forest Management	Environmental, Economic, and Social Values	Scientific Experts	Yes
Pokorny <i>et al.</i> 2004	Amazon, Brazil	Results not reported	Forest Management Sustainability	Multiple Forest Values	Forest managers	No (results not reported)
Waitakere City Council 2004	Waitakere, New Zealand	Measures	Social Well-Being	Māori Social Values	Based on Durie <i>et al.</i> 2002	Yes
Anon. 2005	Fort Nelson, British Columbia, Canada	Measures	Sustainable Forest Management	Environmental, Economic, and Social Values	Forest Industry	Yes
Boyd 2005	Quesnel, British Columbia, Canada	Measures	Sustainable Forest Management	Environmental, Economic, and Social Values	Forest Industry Consultant	Yes
FSC Canada 2005	Across British Columbia	Measures	Sustainable Forest Management	Environmental, Economic, and Social Values	Scientific Experts	Yes
Sherry <i>et al.</i> 2005	Northern British Columbia, Canada	Critical Local Values	Forest Co-management (JPRF)	Multiple Aboriginal Values	Co-management partners	Yes
Elias (no date)	Barriere Lake, Quebec, Canada	Measures	Integrated Resource Management Planning	Multiple Aboriginal Values	Community-focused academic researcher	Yes

6.1.1 Theme 1: Using Dakelh Language and Place Names

Only three measures were identified from the literature to monitor Aboriginal language, two of which originated from frameworks designed specifically to monitor Aboriginal values in natural resources management (Table 6.3). Smyth's (2002) measure relates to place names on maps, and a measure by Sherry *et al.* (2005) relates to use of indigenous language (Table 6.3). Lack of measures related to use of Aboriginal language appears to be a gap in the sustainable forest management (SFM) C&I, with the exception of one measure from Centre for International Forestry Research (CIFOR) which was fully developed (Prabhu *et al.* 1996). Measures related to the condition of (rather than management efforts that address) Aboriginal language and place names occurred frequently in context of community well-being, some of which could be adapted for use in a management context; these community-focused measures are discussed in Theme 6, Condition of C.

Table 6.3. A list of measures identified in the literature that correspond with TI'azt'en Theme 1, 'Using Dakelh Language and Place Names'.

Reference	Criteria	Indicator	Measure
<i>Aboriginal Values in Management</i>			
Smyth 2002	Cultural knowledge	Language	Use of language names for places, rivers etc. on Wet Tropics map
Sherry <i>et al.</i> 2005	Accountability mechanisms	Meaningful public involvement	Use appropriate language for target audience (including use of indigenous language)
<i>Sustainable Forest Management</i>			
Prabhu <i>et al.</i> 1996	Concerned stakeholders have an acknowledged right and means to co-manage forest equitably	Effective mechanisms exist for two-way communication related to forest management among stakeholders	> 50% of timber company personnel and forestry officials speak one or more local language, or > 50% local women speak the national language used by the timber company in local interactions

6.1.2 Theme 2: Respecting Traditional Roles and Governance Systems

The literature reviewed provides 47 measures on ‘Respecting Traditional Roles and Governance Systems’ (Table 6.4). Both SFM and ‘Aboriginal Values in Management’ studies include measures on traditional roles and governance, while community well-being monitoring excludes this theme with one exception (Durie 2002). SFM measures examine acknowledgement of and respect for customary rights, consultation, and involvement in decision-making. SFM measures are more prevalent in this theme than others, possibly because they relate to the legal obligations of forestry companies and governments in Canada and elsewhere. In JPRF case, measures concerning equity and power sharing are minimum standards for Aboriginal involvement and are not relevant for monitoring, as these requirements are currently being met. This highlights the difference in management paradigms between the current framework and those reported in the literature. Smyth (2002) presents Aboriginal measures from an arrangement with a lower level of power sharing, and the only measure relating to this theme requests that traditional land owners be recognized.

The Critical Local Values described in Sherry *et al.* (2005) include a range of traditional roles that should be incorporated into co-management (not all of these were mentioned by participants in this study) (listed as measures in Table 6.4). For example, I inquired into the importance of traditional gender roles during the focus group as it was identified as a Critical Local Value and mentioned in an interview; however, the measure was not considered important by focus group participants. Over time as co-management develops and improves, the measures presented in this thesis may become outdated; Critical Local Values from community research such as Sherry *et al.* (2005) are a potential source of additional measures in the future.

Table 6.4. A list of measures identified in the literature that correspond with Tl'azt'en Theme 2, 'Respecting Traditional Roles and Governance Systems'.

Reference	Criteria	Indicator	Measure
<i>Aboriginal Values in Management</i>			
Smyth 2002	Rights to country	Belonging, identity and freedom	Traditional owners acknowledged as traditional owners
Sherry <i>et al.</i> 2005	Community health and well-being	Cultural revitalization	Restoration of the role of Elders as teachers
			Respect for the oral tradition
			Restoration of traditional forms of governance
		Independence	Recognition and respect for legal and customary rights
	Local control and access over resources	Respect for traditional systems of allocating and accessing resources	Respect for traditional boundaries
			Delineation of traditional hunting territories
			Traditional allocation of fishing grounds
			Traditional allocation of trapping rights
			Traditional allocation of berry picking grounds
	Flexible and adaptive management structure	Incorporation of traditional roles & systems	Role of Elders
			Clan system
			Role of hereditary chiefs
			Traditional involvement mechanisms
	Respect for Aboriginal rights and title in forest management	Fair compensation for damage on traditional lands	Customary land owners
		Fair compensation for resource extraction on traditional lands	Community members
			Customary land owners
	Equitable decision making	Involvement of customary land owners	<i>Keyoh</i> holders, hereditary chiefs
	Employment opportunities	Employment practices are established	Priority hiring of Tl'azt'en Nation members and <i>keyoh</i> holders
		Ensure equity of employment opportunities	Promotion of employment opportunities for <i>keyoh</i> holders
	Adequate Tl'azt'en Nation representation on decision-making bodies	Need for inclusive representation	Ensure representation of traditional land users
<i>Sustainable Forest Management</i>			
Prabhu <i>et al.</i> 1996	Forest management unit is implemented on the basis of legal	-	Documentary evidence of the agreements with local communities under which management is entitled to manage the forest exists

Reference	Criteria	Indicator	Measure
FSC Canada Working Group 2004	title on the land, recognised customary rights, or clear lease agreements		Information on the identity, location, and population of all indigenous and traditional peoples living in the vicinity of the management area or claiming customary rights to the management area exists
			Evidence or statements from the representative organisations of local indigenous or traditional communities defining the extent of their territories exist, and include maps
	Local communities with legal or customary tenure or use rights shall maintain control, to the extent necessary to protect their rights or resources, over forest operations unless they delegate control with free and informed consent to other agencies	Customary tenure or resource use rights held by communities are identified and documented	Documentation, including oral evidence, of customary tenure or rights of land/resource use held by communities
			Maps showing areas of customary rights of land/resource use held by communities
	Appropriate mechanisms shall be employed for resolving grievances and for providing fair compensation in the case of loss or damage affecting the legal or customary rights, property, resources, or livelihoods of local peoples. Measures shall be taken to avoid such loss or damage	There is a track record of successfully resolving disputes to the satisfaction of both parties in a timely manner	Interviews with those with whom the applicant has had a dispute
	Indigenous peoples shall control forest management on their lands and	The applicant keeps abreast of and, in the management plan, is able to demonstrate a good working	The number of distinct indigenous communities having, or claiming rights and interests within the area
			The population and demographic profile of these respective indigenous communities

Reference	Criteria	Indicator	Measure
	territories unless they delegate control with free and informed consent to other agencies	knowledge of the indigenous communities, their legal and customary rights and their interests related to forest lands within the forest management planning area	The political organization and governance structure of each respective indigenous community
			The political mandate provided within that governance structure for consultation and negotiation on behalf of the indigenous community in regard to rights and interests asserted by that community in relation to forest management
			The traditional use areas or lands within the applicant's forest management area asserted by each respective indigenous community
			The extent of overlap between these traditional territories
			The extent to which these traditional use areas have been recognized by the crown
			The traditional and historic use patterns of Each respective indigenous community
			The nature, or basis, of the rights and interests asserted by each respective indigenous community
			The extent to which there is agreement, or lack of agreement, between the crown and the respective indigenous community as to the nature and extent of the rights and interests asserted by each people
			The existence, and current status of negotiations between the crown and the indigenous community regarding rights and interests asserted by each respective indigenous community
			The existence, and current status, of any legal actions related to the rights and interests of each respective indigenous community
	Local communities with legal or customary tenure or use rights shall maintain control, to the extent necessary to protect their rights or resources, over forest operations unless they delegate control	Either: (A) Local communities with legal or customary tenure or use rights retain control over their forest operations, OR, (B) Free and informed consent has been given to any portion of the management plan that affects the	Where (A) has been agreed to then either: -The local communities are the resource manager, or -Customary uses of the forest, which may include hunting, trapping, fishing, use of hiking trails, de facto access to well known landmarks and features and gathering of berries by the public, are sustained by the owner on a permissive basis, or -There is agreement that the manager's activities will protect the rights and resources of local rights holders

Reference	Criteria	Indicator	Measure
	with free and informed consent to other agencies	rights and resources of the community that holds legal or customary tenure or use rights	Where (B), then interview evidence and/or documentation of free and informed consent
Anon. 2005	Forest management sustains or enhances the cultural (material and economic), health (physical and spiritual) and capacity benefits that First Nations derive from forest resources	Forest management recognizes and respects Aboriginal and treaty rights	<p>The percent of disputes resolved (i.e. accepted by both parties) on legally established treaty or legally established customary use rights established through written documents related to potential conflicts</p> <p>Appropriate mechanisms established through written documents/memoranda on the methods and procedures to resolve disputes over treaty and customary use rights</p>
McCarthy 2005	Indigenous peoples shall control forest management on their lands and territories unless they delegate control with free and informed consent to other agencies	The Manager recognizes and respects the legal and customary rights of the First Nation(s) over their lands, territories and resources	<p>First Nation(s) formally indicate clearly and unambiguously, either verbally or in writing, that their legal and customary rights over their lands, territories and resources have been recognized and respected</p> <p>First Nation(s) interests or concerns are clearly incorporated in the management plan</p>
Boyd 2005	Forest management sustains or enhances the cultural (material and economic), health (physical and spiritual) and capacity benefits that First Nations derive from forest resources	Forest management recognizes and respects Aboriginal and treaty rights	Appropriate mechanisms established through written documents/memoranda on the methods and procedures to resolve disputes over treaty and customary use rights
<i>Community Health and Well-being</i>			
Durie <i>et al.</i> 2002	Practise of Māori culture, knowledge and values	-	Adherence to Māori protocol in beginning meetings

6.1.3 Theme 3: Supporting Traditional Cultural Activities

The ‘Community Health and Well-Being’ literature offers only two examples under the theme ‘Supporting Traditional Cultural Activities’, relating to the success of cultural programs and nature of cultural activities. Wright *et al.* (2002) suggest four quantitative measures relating to facilities, contacts, expenditures, and efforts of staff (Table 6.5). While there are few existing measures, the measures are similar in content to those developed in this thesis (Table 5.4).

Table 6.5. A list of measures identified in the literature that correspond with TI’azt’en Theme 3, ‘Supporting Traditional Cultural Activities’.

Reference	Criteria	Indicator	Measure
Sustainable Forest Management			
Wright <i>et al.</i> 2002	Social and cultural values	Education and research	Interpretation, education, and research participation (e.g., number of contacts by type)
			Interpretation, education, research expenditures (e.g., total expenditures or proportion of total expenditures on educational/interpretive/research materials) [alternate measure]
			Research activities (e.g., number of efforts to promote/enable research) [alternate measure]
			Interpretive facilities available (e.g., number of by type)
Community Health and Well-Being			
Parlee and Lutsel K'e First Nation 1997	Cultural education	Success of cultural programs	How successful are the cultural programs currently being offered?
	Land	Cultural activities	What kind of activities are happening which help to preserve culture?

6.1.4 Theme 4: Using Research to Revitalize Traditional Culture

It is logical that there is a greater emphasis on ‘Using Research to Revitalize Traditional Culture’ in the research forest context than in others because a research forest is expected to carry out more research than other resource management arrangements or communities. Of all

programs reviewed, only two SFM monitoring programs included research (Table 6.6). In a review of locally adapted Forest Stewardship Council frameworks, Peachey (2002) identified two measures that assess Aboriginal participation and opportunities for participation in research (Table 6.6). Previously mentioned facilities and programs measures recommended by Wright *et al.* 2002 include research as well (Table 6.6). The measures developed in this project may offer ideas to others involved in collaborative research.

Table 6.6. A list of measures identified in the literature that correspond with TI'azt'en Theme 4, 'Using Research to Revitalize Traditional Culture'.

Reference	Criteria	Indicator	Measure
<i>Sustainable Forest Management</i>			
Peachey 2002	Involvement in management / joint management / assurance resources and rights are not diminished, sites of significance	The forest manager has jointly established with affected Aboriginal communities substantive avenues for participation in the forest management planning process	First Nations with ancestral claims to the forest management area have been given adequate opportunity to participate in planning, research, monitoring and inventories for forest management
			First Nations with ancestral claims to the forest management area participate in planning, research, monitoring and inventories for forest management
Wright <i>et al.</i> 2002	Social and cultural values	Education and research	Interpretation, education, and research participation (e.g., number of contacts by type); Options- Interpretation, education, research expenditures (e.g., total expenditures or proportion of total expenditures on educational/ interpretive/ research materials); Options- Research activities (e.g., number of efforts to promote/enable research)
			Interpretive facilities available (e.g., number of by type)

6.1.5 Theme 5: Using Education to Revitalize Traditional Culture

Education on traditional culture is a topic covered by all types of monitoring programs that were reviewed. SFM measures were again limited to the Wright *et al.* (2002) measures on

facilities and participation (Table 6.7). Community-based monitoring initiatives include measures focused on opportunities for learning specific aspects of cultural knowledge, with a consistent emphasis on language (Baruah 1998; Sherry *et al.* 2005). Previous monitoring work with Tl'azt'en Nation emphasized the need to involve Elders in teaching (Sherry *et al.* 2005), as does this research. In comparison to the literature, this study adds program level measures, as well as further detail on the target skills to be developed. These measures included skills identified as locally important by Hodder and Sherry (2005).

Table 6.7. A list of measures identified in the literature that correspond with Tl'azt'en Theme 5, 'Using Education to Revitalize Traditional Culture'.

Reference	Criteria	Indicator	Measure
<i>Aboriginal Values in Resource Management</i>			
Smyth 2002	History	Understanding history	Number of Aboriginal studies programs in schools
Sherry <i>et al.</i> 2005	Community health and well-being	Cultural revitalization	Restoration of the role of Elders as teachers
Parlee and Lutsel K'e First Nation 1997	Language	Opportunities for learning Chipewyan	The number of opportunities for learning Chipewyan
			What are the opportunities for learning Chipewyan?
	Cultural Education	Traditional land activities for educating youth	What kinds of traditional land use activities currently involve opportunities for educating youth?
<i>Sustainable Forest Management</i>			
von Mirbach 2000b	Accepting society's responsibility for sustainable development	Participation by Aboriginal communities in SFM	Extent to which forest and ecosystem workers and managers view educational videos or receive other orientations produced by Nuu-Chah-Nulth people about their perspectives on forest practices, impacts on the environment and their culture
			Training and education programs on ecosystem management processes and practices are made available to the Nuu-Chah-Nulth
Wright <i>et al.</i> 2002	Social and cultural values	Education and research	Interpretation, education, and research participation (e.g., number of contacts by type)
			Interpretation, education, research expenditures (e.g., total expenditures or proportion of total expenditures on educational/interpretive/research materials) [alternate measure]

Reference	Criteria	Indicator	Measure
			Research activities (e.g., number of efforts to promote/enable research) [alternate measure]
			Interpretive facilities available (e.g., number of by type)
<i>Community Health and Well-being</i>			
Durie <i>et al.</i> 2002	<i>Te Reo</i> Māori (language) in multiple domains	-	Number of Māori enrolled in Māori language courses
			Number of children attending Māori immersion schools
			Number of Māori immersion courses available at all levels of the education sector
Baruah 1998	Final list of indicators for Tl'azt'en Nation	To promote preservation of culture and language	Percent of children in Carrier language classes
			Percent of eligible Elders involved in teaching traditional skills
			Percent of youth learning traditional skills
	Sustainable indicator evaluation matrix	Preservation of language and culture	Percent of children in Carrier language classes
			Percent of eligible elders involved in teaching traditional skills
			Percent of youth learning traditional skills
Waitakere City Council 2004	Māori wellbeing	<i>Te Reo Māori</i> [language]	Increased enrolments in <i>kohanga reo</i> [Māori immersion pre-school] and <i>kura kaupapa Māori</i> [Māori immersion school]
			Increased number of community classes and tertiary papers in <i>Te Reo</i> offered in Waitakere City

6.1.6 Theme 6: Condition of Traditional Culture

While previous measures in this thesis examined cultural revitalization in a management context (i.e., JPRF contributions towards community goals), the measures in theme six look specifically at the condition of traditional culture within a community (i.e., results orientation). Parlee and Lutsel K'e First Nation (1997) explore the idea of cultural revitalization or cultural well-being in an indigenous community, using subjective measures about community conditions, and objective measures such as skill levels. In management contexts, Elias (nd), Smyth (2002), Alzate (2000), and Blauert and Quintanar (2000) have also developed measures for cultural conditions, relating to language and traditional name usage, participation in traditional activities, and spiritual well-being. This should not be confused with previous management-focused themes

that examine management efforts towards cultural revitalization (e.g., education and research programs). Further exploration of this topic required for monitoring the success of the JPRF.

Table 6.8. A list of measures identified in the literature that correspond with TI'azt'en Theme 6, 'Condition of Traditional Culture'.

Reference	Criteria	Indicator	Measure
<i>Aboriginal Values in Management</i>			
Elias nd	n/a	Social fabric	Increasing use of Algonquin language
			Increasing participation in traditional feasts
	n/a	Local economy	Increasing participation in traditional production activities
			Use of language names for children
Alzate 2000	Spirituality	Perception of the surroundings	Extent of recorded language - is it on tapes and/or written down for future transmission?
			Consultations made by the farmer to the traditional doctor
			Farmers who establish a harmonious relationship with the environment
			Indigenous rite performed on the plot by a 'medicine man', to bring harmony or heal the land, plants, animals or human beings
Blauert & Quintanar 2000	Self-esteem / creativity / critical reflection / cultural identity	-	Health (spiritual well-being)
Smyth 2002	Cultural knowledge	Language	Number of language speakers (right through)
<i>Sustainable Forest Management</i>			
von Mirbach 2000b	Accepting society's responsibility for sustainable development	Participation by Aboriginal communities in SFM	People maintain spiritual links with the land

Reference	Criteria	Indicator	Measure
FSC Canada Working Group 2004	Forest management shall not threaten or diminish, either directly or indirectly, the resources or tenure rights of indigenous peoples	The applicant makes use of an existing assessment or, in the absence of an assessment, undertakes a joint assessment of indigenous resources and tenure rights with the affected indigenous communities	Baseline data on numbers of traditional land users, revenues generated from traditional land-use
<i>Community Health and Well-being</i>			
Parkins, Stedman & Varghese 2001	Tradition	-	The number of residents speaking Cree
			Access to traditional knowledge
Parkins, Varghese & Stedman 2001	Opportunities to retain language	-	Number of residents who speak Cree
	Community sustainability	-	Number of residents who speak Cree
	Access to traditional knowledge	-	Number of traditional ceremonies
	Subsistence lifestyle	-	Percent of meat need met through subsistence
Parlee and Lustel K'e First Nation 1997	Language	Speaking Chipewyan	How many people are speaking Chipewyan at home?
		Formal use of Chipewyan	The number of families using Chipewyan
			How much is Chipewyan being used during formal events?
	Traditional knowledge	Knowledge of traditional values	The number of public meetings, workshops or public events where Chipewyan is formally used
			How much do people respect the land, water, wildlife?
		Knowledge about harvesting	Number of people who understand respect for the land, water, wildlife as important to the Dene way of life
Baruah 1998	Final list of indicators for Tl'azt'en Nation	To promote preservation of culture and language	Number of people who know how to make fires, trap, hunt, set nets, survive in the cold, tan hides, make dry meat, sew moccasins
			Percent of people involved in traditional activities like trapping, hunting, fishing, berry picking, etc.
	Sustainable indicator	Preservation of language and	Percent of people who speak, read and write Carrier

Reference	Criteria	Indicator	Measure
	evaluation matrix	culture	Percent of people involved in traditional activities like hunting, fishing, trapping, berry picking
Waitakere City Council 2004	Māori wellbeing	Culture and cultural identity	Number of <i>Iwi</i> [tribe] and <i>Hapu</i> organisations, including Tribal trusts, <i>Taura</i> [urban tribal groups] here, and <i>Iwi</i> service providers
		<i>Tino rangatiratanga</i> [autonomy]	Number of <i>Kaupapa Māori</i> [Māori Philosophy] organisations, including trusts, incorporated societies and businesses
Durie <i>et al.</i> 2002	Positive Māori participation in society as Māori	-	Involvement in Māori cultural and sporting teams
			Identification as Māori
			Knowledge of <i>whakapapa</i> [genealogy]
			<i>Marae</i> attendance [sacred place]
			Role <i>whānau</i> [family] plays in life
			Level of contact with Māori
			Māori language ability
	<i>Te Reo Māori</i> [language] in multiple domains	-	Number of adults able to converse in Māori
			Number of domains where Māori use is encouraged (particularly media)
	Practise of Māori culture, knowledge and values	-	May be able to measure practice through <i>marae</i> attendances, <i>kohanga</i> , <i>powhiri</i> , <i>karakia</i> , <i>kaumātua</i> presence, health practices, publications (fiction, non-fiction), arts (<i>kapa haka</i> , displays of visual, multimedia, music, oral, and sculpture compositions)
			At an organisational level the number of <i>powhiri</i> [welcoming ceremony], <i>poroporoaki</i> [lament] and <i>tangi</i> [funeral] leave in work places

6.1.7 Summary of Measures Themes

It is difficult to complete a gap analysis of the thesis results using the literature on a thematic level due to the many variables present in each type of monitoring project restricting comparability. The most obvious gaps in the measures developed in the current study are those that were excluded from the research at the outset to manage scope (e.g., the indicator

“Contribute to community development” described in Table 4.1). As a result, several related topics are evident in the literature, but not in the TI’azt’en measures of cultural revitalization, including spatial elements of cultural revitalization such as protection of culturally-important areas, use of traditional environmental knowledge, and access to land (e.g., Prabhu *et al.* 1996; Smyth 2002; FSC Canada Working Group 2004). Other Aboriginal communities have associated cultural revitalization with social themes, including forest-based economic development, meaningful participation in decision-making, and community well-being (Smyth 2002; Sherry *et al.* 2005). It must be emphasized that the TI’azt’en measures developed in this thesis focus only on cultural revitalization; measures of success are required for the full spectrum of identified Critical Local Values.

This work highlights some differences concerning the extent and nature of the topics covered in expert-driven SFM measures and community-based management-focused measures. In SFM monitoring, recognition and incorporation of Aboriginal cultural values are considered essential elements of successful forest management. Yet in ‘Aboriginal Values’ monitoring, measures are much more detailed, and expectations for cultural revitalization seem to be higher in comparison to SFM monitoring. SFM measures are generally designed to assess compliance with sustainability standards, one component of which is indigenous peoples’ rights. Many local adaptations of SFM C&I admit that Aboriginal measures are inadequate and incomplete (e.g., von Mirbach 2000b). Examples of poor SFM measures exist in a framework on ‘Aboriginal Rights’ in the Morice region of British Columbia (Wolfe 2003). The first measure is ‘the number of communications sent’, the second is, ‘the percent of communications receiving response’, and the third is, ‘percent of forest management commitments completed on time resulting from consultations regarding non-timber features and interests’ (Wolfe 2003). These measures are

likely unacceptable from an Aboriginal perspective and potentially are inadequate from a legal compliance perspective.

Weaknesses in SFM measures are not necessarily a sign of unwillingness to address Aboriginal issues. SFM institutions, particularly at local levels, may not have the capacity and leadership needed to create sufficient measures of Aboriginal forest values. Another potential reason for the shortcomings of Aboriginal measures in SFM frameworks is restricting First Nations needs, concerns, and issues to an “Aboriginal Values” criterion or theme. These measures tend to focus on existing consultation practices, rather than considering the full spectrum of Aboriginal forest values, rights, and title. A review of existing ‘Aboriginal Values’ frameworks may offer for ideas for restructuring SFM measures in a more inclusive and holistic manner. As well, analysis of the range of measures themes presented in this thesis may highlight previously unconsidered topics from an SFM perspective, particularly non-spatial values.

6.2 *Measures Characteristics and Evaluation*

The use of effectiveness characteristics, criteria, or guidelines is common amongst measures development processes (Prabhu *et al.* 1996; Rossi, Lipsey and Freeman 1997; Warren 1997; Cobb and Rixford 1998; Hart 1999; Sidersky and Guijt 2000; von Mirbach 2000b; Parkins, Stedman and Varghese 2001; Wright *et al.* 2002; Elias nd). Unfortunately, none of these sets of effectiveness characteristics have been created specifically for use in a First Nations context. This thesis offers new perspectives on effectiveness characteristics through examination of literature and work with Tl’azt’enne.

6.2.1 Measurement Approach

While the literature has not recommended measures characteristics equivalent to those produced in this thesis, there are many similarities. Methodology is addressed in the literature, but specific recommendations are rarely given. Discussions on the types of measures that should be produced are relatively uncommon, although there are exceptions (e.g., Prabhu 1996; von Mirbach 2000b, Elias nd). The category 'Measurement Approach' offers a new orientation to the use of effectiveness characteristics.

6.2.1.1 Apply an Empowerment Methodology

The present method was largely successful in fostering empowerment according to the principles of Empowerment Evaluation (see section 5.2.1.1). I could not identify measures in the literature that were developed specifically utilizing the "Empowerment Evaluation" methodology, although the philosophies of some projects are aligned with this characteristic (e.g., Alzate 2000, Blauert and Quintanar 2000, Sidersky and Guijt 2000). Participatory evaluation is critical in indigenous communities as they have unique evaluation needs, such as the "incorporation of indigenous epistemologies into Western evaluation practice" (LaFrance 2004, pg 41). Participatory Rural Appraisal promotes the philosophy that local people have capacity to accomplish complex tasks related to evaluation and planning (Chambers 1997; Estrella *et al.* 2000). New thinking on empowerment and participatory evaluation reinforces these concepts, provides principles for implementation, and describes multiple benefits for marginalized groups and program efficacy (Guijt 1999; Fetterman and Wandersman 2005). Communities, practitioners, and researchers have found value in engaging indigenous people in

measures development processes (Parlee and Lutsel K'e First Nation 1997; Parkins, Stedman, and Varghese 2001; Smyth 2002; Sherry *et al.* 2005; Sherry *et al.* nd-b).

The empowerment evaluation orientation conflicts with prevailing forest management processes for measures development, which depend on outside experts with specialized knowledge and professional or scientific training rather than those with localized expertise (von Mirbach 2000b; Wright *et al.* 2002). Related research with Tl'azt'en Nation has shown that these top-down processes result in indicators that are not fully consistent with community values (Sherry *et al.* 2005). This is further evidenced by the fact that Tl'azt'en Nation stands in opposition to Canadian Standards Association (CSA) certification⁴⁷, as does the National Aboriginal Forestry Association.⁴⁸ Professional evaluators have identified similar inconsistencies between top-down and bottom-up approaches to evaluation (Fetterman and Wandersman 2005), and have determined their success by gauging the level of community participation (Sidersky and Guijt 2000). Empowerment evaluation is also necessary to ensure that measures are applied in culturally-appropriate way. LaFrance emphasizes that Aboriginal measures must be used in the spirit of "respect, reciprocity and relationship", and that the evaluation be designed to "use the methodologies that fit within [First Nations'] framing of place, community, values and culture" (2004, pg 43).

6.2.1.2 Utilize Subjective and Objective Measures

The measures development process was fully successful in creating a balance of subjective and objective measures across each theme, as demonstrated in Figure 5.1. This allows

⁴⁷ Focus group comments, Tl'azt'en community member, November 15th, 2005

⁴⁸ In October 2004 the Sierra Legal Defence Fund (SLDF), on behalf of its clients the Sierra Club of Canada (SCC) and the National Aboriginal Forestry Association (NAFA), initiated eleven appeals of forest certifications issued to the Canadian Standards Association's (CSA) Sustainable Forest Management standard. Reference: <http://www.sierraclub.ca/national/programs/biodiversity/forests/csa-appeal/campaign.shtml?x=750>

for each of the six themes to be measured using both types of measures, with at least one of each type of measure per theme. The objective measures provides fact-based, reliable evidence of the status each theme, while the subjective, opinion-based measures ensure that community voices are heard, which will either corroborate or bring into question the objective results. I accomplished this by focusing on this goal while crafting the measure statements, being mindful to create at least one subjective measure for each theme.

During a thorough review of 10 forest management evaluation frameworks, I identified 10 subjective measures relating to cultural revitalization. For instance, the Forest Stewardship Council integrated community perspectives by gauging the satisfaction of community members, and also by conducting interviews with specified individuals on matters relating to management successes (FSC Canada Working Group 2005). Another Sustainable Forest Management program used a measure of perception of an issue indirectly tied to forest management, which is “Perceived Racism in Community (e.g. First Nations - Non-First Nations)” (MacKendrick and Parkins 2004). Yet another SFM monitoring program included a measure that would be assessed likely by inquiring into local people’s opinions, which is “People Maintain Spiritual Links with the Land” (von Mirbach 2000b).

Subjective measures are more common in community monitoring programs (Parlee and Lutsel K'e First Nation 1997, Duhaime *et al.* 2004). For example, by forming opinion-based measures as a foundation of their monitoring program, the Lustel K'e approached measures in the form of quantitative and qualitative interview questions (Parlee and Lutsel K'e First Nation 1997). This participatory monitoring program involved community members in all aspects of monitoring, including design, data generation, data analysis, and reporting. Innovative academic work in an indigenous community has also incorporated opinions of local people through

measures (Duhaime *et al.* 2004). In this project, objective and subjective/qualitative (or ‘behavioral’ and ‘perceptual’) measures were utilized to better understand social cohesion and well-being (Duhaime *et al.* 2004). For example, “Access to and use of subsistence harvesting equipment” relates to cultural revitalization, and “Level of satisfaction with regional government” demonstrates the use of a satisfaction measure (Duhaime *et al.* 2004).

In contrast, some top-down monitoring programs eliminate measures that are not ‘objective’ or ‘scientifically valid’ in an effort to reduce the number of measures in their framework (Warren 1997; Wright *et al.* 2002; Elias nd). Social indicators typically rely solely upon objective sources such as statistics and economic figures, which often fail to represent community-scale needs (Parkins, Varghese, and Stedman 2001). While validity is a concern for subjective measures, it should not be used to justify their elimination as they reflect critical community perspectives.

6.2.1.3 Assess Management Efforts and Community Conditions

Participants suggested that management-focused measures alone are insufficient, and recommended including some community-focused measures to ensure that co-management benefits extend beyond the JPRF boundaries. While community and regional conditions are influenced by many factors, JPRF cannot be entirely successful unless it creates positive change for Tl'azt'enne. Participants did not think that JPRF should be “held to account” for ensuring community well-being; however, monitoring of community conditions was considered valuable. By way of example, one focus group participant explained that, “[The JPRF] shouldn’t be evaluated on the basis of how proud [Tl'azt'enne] are. They can’t be held accountable for that.

Tl'azt'enne need to hold themselves accountable.”⁴⁹ Failures to achieve targets related to community outcomes in the short-term need to be put into context relative to the amount of effort invested by the JPRF. For example, if *keyoh* holders are interested only in minimal participation in co-management despite significant and sincere efforts to involve them through diverse and culturally appropriate means, this should not reflect poorly on the JPRF. Management-focused measures can provide the needed context in cases where community outcomes have not been achieved. In the case of the above example, a measure such as “Satisfaction of *keyoh* holders with JPRF land-based projects and activities” could provide perspective. As well, some ambitious long-term goals such as economic development and diversification may be difficult to measure in the short-term, but monitoring co-management efforts towards them is important and reflects the orientation that co-management involves learning-by-doing.

Literature indicates that an important criterion of a successful evaluation program in an indigenous community is that it contributes to larger community goals (LaFrance 2004). Inherent difficulties occur with measuring an organization’s impact as there are many effects that cannot be isolated (Wright *et al.* 2002). Thus both community- and management-focused measures must be included in a full measures set.

Measures development processes that engaged local indigenous groups in co-management evaluation often result in community-focused measures (Karjala 2001; Smyth 2002; Sherry *et al.* 2005). In contrast, review of two local measures development processes led by forestry companies showed that they emphasized measures that were directly linked to management activities, and lacked those that measure community conditions (Anon. 2005; Wolfe 2003). This lack of community-focused measures may be due to concerns about liability and monitoring of conditions beyond the organization's control, or perhaps because the idea of

⁴⁹ Interview with a Tl'azt'en community member in Tache, June 29th, 2005

monitoring community conditions seems beyond the jurisdiction of a forestry company. Treating community-focused measures differently for evaluation purposes might alleviate these concerns: for instance by setting less stringent targets and classifying community-focused outcomes as indirect responsibilities.

6.2.1.4 Take a Mixed-Methods (Qualitative/Quantitative) Approach

The measures developed in this thesis utilize a mixed-method approach in each of the themes. This was achieved simply by considering this factor while creating the measures from the participants' input. The quantitative measures help provide more consistent measures that are comparable over time, while the qualitative measures allow for the flexibility to provide contextual descriptions and explain how results are achieved.

From a program evaluation perspective, qualitative measures are critical: "Qualitative methods are always necessary to gather contextual and relational qualities of programs within the community" (LaFrance 2005, pg 15). Many monitoring programs prefer quantitative measures for their objectivity, ease of data management, and comparability in time and space (Warren 1997).

SFM measures development processes frequently reject qualitative measures through the use of screening criteria (e.g., measures that are specific and measurable), although admittedly "there are often situations when [qualitative measures] are either more meaningful or more practical than any others" (von Mirbach 2000b, pg. 195). Others also warn against the strict use of quantitative measures, as they may not always provide information about the qualities or values we seek to understand (Cobb and Rixford 1998). From an indigenous perspective, positivist assumptions and over-simplification of issues is problematic, thus quantitative measures alone are inadequate (LaFrance 2005).

Yet, quantitative measures predominate in the monitoring and evaluation literature, using counts, percentages, ratios, and closed-ended surveys responses. Management processes have been assessed by quantifying activities such as communication (e.g., letters, meetings and requests), service provision (e.g., number of programs or facilities, dollars) and collaboration (e.g., number of agreements, complaints, disputes and informal interactions) (Parlee and Lutsel K'e First Nation 1997; Smyth 2002; Wright *et al.* 2002; FSC Canada 2004; Anon 2005). Quantitative, subjective measures have been assessed through surveys of social forest values. For example, a seven-point scale was used to measure community members' satisfaction with elements of sustainability of Montreal Lake (Parkins, Stedman, and Varghese 2001). Others have used survey questions that quantify perceptions of access, health, awareness, and racism (von Mirbach 2000b; Wright *et al.* 2002; MacKendrick and Parkins 2004).

Few have created unambiguous qualitative measures (Parlee and Lutsel K'e First Nation 1997; Smyth 2002). For example, qualitative indicators were developed on a prospective basis by Blauert and Quintanar (2000), but associated measures were not published. In an evaluation study in Oaxaca, Mexico, 'intangible indicators' are described, such as "awareness in natural resource conservation", yet the final evaluation framework was not provided. The authors stated the problem clearly: "What is critical then is the need to refine how [qualitative] indicators are measured, using which methods" (Blauert and Quintanar 2000, pg. 44). Parlee and Lutsel K'e First Nation (1997) implied a method by using qualitative interview questions as measures, such as, "How successful are the cultural programs being offered?". Often, incomplete descriptions are given for qualitative measures, without instructions on how to evaluate the data once collected (e.g., Parlee and Lutsel K'e First Nation 1997; Smyth 2002). A measure by Smyth (2002), "Extent of recorded language – is it on tapes and/or written down for future

transmission” would likely need to be assessed qualitatively, but clarification is needed. There is a stated need for further research on the development of qualitative measures, whose methodologies have been perceived to this point in time as “complex..., diffuse, and ‘risky’” (Bell and Morse 2001, pg. 307).

Aboriginal-focused measures frameworks frequently combine quantitative and qualitative measures (Parlee and Lutsel K'e First Nation 1997, Smyth 2002, Duhaime *et al.* 2004). Smyth (2002) combined quantitative and ‘descriptive’ measures to measure indigenous cultural values in an Australian protected area. Māori of New Zealand and the Algonquins of Barriere Lake have developed larger scale monitoring programs that place a greater emphasis on quantitative measures (Durie *et al.* 2002; Elias nd). The balance between quantitative and qualitative measures may be more influenced by scale than by cultural perspective, as many small-scale, non-Aboriginal evaluation programs also utilize qualitative measures (Fetterman and Wandersman 2005).

6.2.2 Measure Wording

Little guidance has been provided in the identified literature for wording measures appropriately. As amply revealed by this thesis, Aboriginal approaches to evaluation differ in their foundations to mainstream approaches, and this is reflected by the language of the measures themselves. I had originally hoped that participants could assist with the wording of each measure, but this was impractical due to the amount of data and the extent of training required. Fortunately, participants recommended two criteria to guide the phrasing of each measure.

6.2.2.1 Measures Should Have a Positive Focus

The characteristic, “Measures should have a positive focus” was achieved for all of the measures developed in this thesis as explained in Section 5.2.2.1. LaFrance (2004) argues that, historically, the negative characteristics of indigenous peoples were overemphasized in the social sciences, a characteristic which has the potential to be transferred to evaluation exercises.

Although I was unable to identify evaluation projects that considered the wording of the measure as a factor in determining its appropriateness, the Māori did use the word “positive” a number of times in their evaluation framework (e.g., “Positive Māori participation in society as Māori”) (Durie *et al.* 2002).

6.2.2.2 Measures Should Build Capacity through Wording

The design of this research was such that the only source of measures ideas was from Tl'azt'en participants. Thus, because participants did not contribute any examples of technical measures, none were included in the measures set. Because technical concepts were not used, the method was not successful in ‘building capacity through wording’, the sixth Tl'azt'en Measures Characteristic.

The most technical measures in the social indicators are often indices that combine multiple factors into one variable, such as Gross Domestic Product (GDP) or the Index of Social Health (Cobb and Rixford 1998). Measures for water quality may provide a better example where measures wording can build capacity. For instance, Tl'azt'enne do not want non-technical measures which may be second-rate simply because few Tl'azt'enne may understand the terminology used in modern water testing. I did not identify any examples in the literature of locally relevant, technical measures of cultural revitalization. While this topic may be less

applicable for capacity building through measure wording, the concept should be considered in all cases, particularly if the community requests incorporation of scientific expertise. For future applications of this method, technical measures should be collected from the literature and incorporated in cases where community support for its use is demonstrated.

6.2.3 Data Quality

The quality of each measure within the Tl'azt'en set can be assessed according to three basic criteria: validity, trustworthiness, sensitivity to change, and practicality. Each of these criteria appeared frequently in the literature, across all types of evaluation. However, since my understanding of these terms was rooted in my culture and worldview of each concept, definitions were needed for use as Tl'azt'en measure characteristics. The quality of the measures developed in this thesis cannot be fully determined until the measures information is collected.

6.2.3.1 Measurement Validity

While the concept of validity is straightforward, testing for validity is often challenging (Rossi, Lipsey, and Freeman 2004). This idea corresponds with the recommended approach established for Tl'azt'en measures: “validity turns out to depend very much on whether a measure is accepted as valid by the appropriate stakeholders” (Rossi, Lipsey, and Freeman 2004, pg 44). It is also recommended that multiple measures be used to assess each objective or value; if the results are consistent with one another, the measures are likely valid (Rossi, Lipsey, and Freeman 2004). Results of the measures should also be somewhat predictable and correlated (Warren 1997; von Mirbach 2000b; Rossi, Lipsey, and Freeman 2004). In the JPRF case, measurement validity, or validity that is “concerned with the soundness and trustworthiness of inferences associated with information gathering tools and procedures” (Kirkhart 1995, pg 4) will need to

be assessed further once methods are determined for collecting information, using procedures appropriate for quantitative and qualitative measures (e.g., Johnson 1997; Guba and Lincoln 1989).

6.2.3.2 Trustworthiness

Many of the measures characteristics reviewed included reliability or trustworthiness (Parkins, Stedman, and Varghese 2001; Prabhu *et al.* 1996; Sidersky and Guijt 2000; von Mirbach 2000b). Reliability refers to “the extent to which the measure produces the same results when used repeatedly to measure the same thing” (Rossi, Lipsey, and Freeman 2004, pg 218). The most reliable measures are generally quantitative, objective measures (Rossi, Lipsey, and Freeman 2004). Subjective measures are often less reliable for a number of reasons, including “differences in the testing or measuring situation, observer or interviewer differences in the administration of the measure, and even respondents’ mood swings” (Rossi, Lipsey, and Freeman 2004, pg 219). The same authors also recommend the “test and re-test” strategy, where findings are compared and correlations are used to quantify the measure’s reliability.

The trustworthiness of measures can only be accurately assessed through discussing measures results with community members, JPRF staff, and others interested in the results. The measures-level estimate, which indicates that 48% of measures are highly trustworthy and 52% at moderate, seems to show that there is room for improvement; however, it must be emphasized this is based on the assumption those with an interest in the evaluation will trust objective measures over subjective ones, and also that they will trust a quantitative measure more than a qualitative one. It is more likely that amongst those interested in the results, there will be varied opinions about what constitutes a trustworthy measure. The thematic-level estimate indicates that each theme is fairly balanced between the use of the various measures types (qualitative,

quantitative, subjective and objective). The estimate of measure diversity may be a better predictor of trustworthiness given the diversity of those interested in the JPRF (e.g., First Nations community members, foresters, educators, and researchers).

Trustworthiness may also be reinforced through use of multiple, mixed-methods measures for each indicator (Rossi, Lipsey, and Freeman 2004). Method selection may influence the reliability of subjective and qualitative measures to a greater extent than the measures description, thus future reliability assessments will be needed once methods for reporting on measures are elaborated.

6.2.3.3 Practicality

Based on initial estimates, the measures have been successfully designed to be practical in nature with 42% of measures requiring less than 30 minutes each to assess. Further, the flexibility of the design with 'recommended' and 'potential' measures encourages adoption of measures only where they are practical to implement.

Measures arising from this research were designed not for academic purposes, but to support adaptive co-management in practice. Tl'azt'enne opinions matched recommendations in the literature that insist that measures must be realistic and practical to ensure they can be effectively implemented. This was a criterion expressed widely throughout Aboriginal and non-Aboriginal frameworks, using top-down and bottom-up approaches, on topics including forest management, education, and well-being (Prabhu *et al.* 1996; Warren 1997; Sidersky and Guijt 2000; von Mirbach 2000b; Parkins, Stedman, and Varghese 2001; Wright *et al.* 2002; Elias nd).

6.2.3.4 Sensitivity to Change

Of all the characteristics in the measure quality category, it is most critical that assessments of sensitivity are completed for adequate evaluation. No reasonable estimates of sensitivity are possible, although the design of the method is expected to create highly sensitive measures as local people have the most intimate knowledge of local processes and conditions.

Sensitivity was used as a criterion for several measures projects (Prabhu *et al.* 1996; Warren 1997; von Mirbach 2000b; Parkins and Beckley 2001; Wright *et al.* 2002; Elias nd). Rossi and others (2004, pg 220-221) define sensitivity of a measure as, “the extent to which the values on the measure change when there is a change or difference in the thing being measured”. It relates to selecting the appropriate concept to measure (that which changes) and the appropriate scale. The recommended method for ensuring sensitivity is to use measures that have been tested elsewhere with very similar programs or organizations (Rossi, Lipsey, and Freeman 2004). Unfortunately, as measures of co-management are relatively new, opportunities to compare measures to other studies are rare. Even of the multiple types of measures development contexts (e.g., Sustainable Forest Management, Community Sustainability, Program Evaluation, and Social Indicators), I could not identify any research on the evaluation of local-level indicators and/or measures of social or cultural values. Of the measures found through literature review, no evidence of long-term testing could be identified, which is necessary for sensitivity analysis. Measures screening by sensitivity was completed in a community-based monitoring program designed to monitor change during a period of mineral development expansion in the Northwest Territories (Parlee and Lutsel K'e First Nation 1997). The authors did not ask participants to consider sensitivity; rather, they reduced the Lutsel K'e measures set by

eliminating measures were not previously used in the literature.⁵⁰ As well, in the literature, discussions of insensitive measures frequently refer to quantitative, program level measures (e.g., administering pre- and post-program math tests) (Rossi, Lipsey, and Freeman 2004). Complex statistical techniques for assessing sensitivity of environmental measures also exist (Walters 2001).

Sensitivity of measures can be achieved though working with communities. Local people are most knowledgeable about local conditions, so their insights on monitoring provide the most accurate gauge for sensitivity. In this study, there was no additional process for ensuring sensitivity other than following the recommendations of local people. In the spirit of transparency, community participation throughout the measures development method, and a bottom-up approach, I choose not to screen measures using literature, and not to adopt well-tested measures from other projects. In a pioneering field, I felt it was important to promote innovation, rather than to replicate previously used measures. Tl'azt'en measure sensitivity should be further tested once information is collected.

6.3 *Method Evaluation*

The evaluative results pertaining to method elaborated in this study are discussed in terms of the effectiveness of each of the major research steps. Further, the method as a whole is discussed in the context of the literature.

⁵⁰ This stage of the research also appeared to reduce the number of qualitative indicators, although this was not discussed or explained in the report.

6.3.1 Effectiveness of Research Steps

This section examines the effectiveness of the process in ascertaining participants' ideas and recording them accurately. The purpose is not to recommend one procedure over another, but rather to explore the role that each plays in the research process, to determine the necessity of each step, to recommend improvements, and to highlight strengths and weaknesses.

6.3.1.1 Personal Transformative Process

The purpose of completing the personal transformation stage of method was to generate accurate results through establishing myself as a trustworthy individual among Tl'azt'enne, acquire social norms, and also to learn about the community so that I could contextualize what I encountered. Prior to my work with Tl'azt'en Nation, I had minimal interaction with First Nations people, and little exposure to their cultures. In prior studies, I completed one course on First Nations approaches to natural resource management; however, I had no personal experience and no motivation to pursue work with Aboriginal issues.

I began to understand Tl'azt'enne through professional and then personal relationships with the Tl'azt'en researcher, Beverly John.⁵¹ Through learning about the John Prince Research Forest and studying the transcripts of those interviewed about the JPRF, I became interested in contributing to the co-management endeavor. Later, through exploration of available documentation, I came to appreciate the struggles and complexity of present First Nations realities as a result of colonization. Through my experience learning about First Nations communities and history, I feel that I now understand how I can contribute effectively to community development. Not only did I feel this personal change internally, but I also

⁵¹ We were first hired in 2003 as research assistants on a project funded through the British Columbia Forestry Innovation Investment program.

demonstrated my transformation through the skills I developed as a community researcher.

Tl'azt'enne have demonstrated their faith in my abilities as a community researcher as they have asked me to participate in a number of First Nations projects, ranging from local to provincial levels.

6.3.1.2 Data Generation Process

Measures Interviews

a) Participation

The 69% response rate for the measures interviews reflects adequately on the study (Table 5.9). Goldschmidt (1996) reports that two-thirds of experts who agree to participate in an expert-based study will abandon the process. Participation was generally consistent among the various types participants (e.g., age, gender, educational background), with the exception of Elders. Unfortunately, the lack of Elder participation demonstrates that the method may have a bias against Elders. This may be due to participant fatigue from the previous JPRF outcomes interviews (e.g., they felt they did not have more information to share), or they might not have been comfortable with the specific nature of the questions. In future studies, Elders may need to be involved using a more culturally appropriate method such as field visits or informal discussions.

b) Participant Well-Being

As observed by Beverly John, the community researcher, the single-person interviews allowed participants to speak freely, without being interrupted, corrected, or judged by peers, in a non-competitive atmosphere. The community researcher's presence seemed to help participants

to feel comfortable and relaxed, encouraging them to share their thoughts openly and honestly in a culturally sensitive environment. Interviews were scheduled at the convenience of the participants, in terms of location and time. The short duration of the interview was also suitable for participants, as it did not significantly interrupt busy schedules.

The interviewees had prepared for longer and more difficult interview questions; therefore, more interview questions would have been appropriate, particularly given the volume of data produced by the procedure. As one of the greatest challenges of this process was scheduling interviews, greater interview length would also increase productivity to a large extent. It is uncertain if additional data may have produced more measures, or simply further corroborated others' responses. In the focus groups, participants expressed that the interviews were an important and valuable stage of the research (Table 5.10).

c) Expression of Measures Concepts

This project asked participants to consider how they might *evaluate* their goals and objectives, in contrast to most research in Tl'azt'en territory which has asked participants to identify and discuss their values. Interview questions were very direct and focused (see Appendix 1); therefore answers were often simple and required little elaboration. As interviewees usually took a few moments to understand the concept of measures, questions asked at the beginning of the interview were occasionally revisited. This conceptual understanding was the most challenging part of the interview, and subsequent questions were less difficult.

For some participants, particularly those who were younger and had some post-secondary education, the questions were clearly understood and quite literal measures were recommended. For others it was through discussion of desired JPRF cultural revitalization outcomes that factors emerged. Older participants tended to use the more traditional approach of speaking: first

providing context on the issue, then slowly narrowing in to the main idea. Often, their main message was to reinforce the importance of an outcome; the wording used and the discussion of the outcome was critical to understanding exactly which aspects were important to evaluate. For example, when asked how to measure the success of the JPRF in using Dakelh language, one participant explained how it is important that language is used and taught to young people, and that young people do not understand even a few words. He went on to explain that Dakelh words need to be placed side by side with English words so young people can learn. This response contributed to a measure relating to bilingual maps and signs for the JPRF.

d) Contributions of the Measures Interviews

In addition to generating information, the interviews provided an opportunity to establish rapport with participants. During scheduling, and before and after the interviews, informal discussions provided insight about current community issues and needs, and potential barriers to participation. The discussion also provided models of effective communication techniques (e.g., use of humour, pauses in the conversation, and non-verbal techniques). The interviews offered an important opportunity to explain the project goals, methods and concepts. They also allowed me to gauge participants' comprehension of preparatory materials, which helped in designing an appropriate focus group introduction. This process was also helpful for generating feedback from the community research coordinator as it enhanced her familiarity with the project.

Focus Group

The focus group provided the richest source for the method evaluation, as participants provided direct feedback (Table 5.10). While participants contributed a number of recommendations, the overall response showed support for my work. Although the focus group

could not be longer in duration or faster in pace (Table 5.10), we were not able to work through all of the themes. One recommendation from a participant was to divide the group in two (Table 5.10). This modification could improve group communication and overall productivity, although at least two facilitators with a clear understanding of the process would be required. In future applications of the method, clarity of instructions could be improved by reviewing interview materials more thoroughly with participants, and further explaining the C&I framework and analysis process.

a) Participation

The participation rate in the focus group was adequate, but disappointing with a 57% response rate including second round invitations. The focus group had weaker participation due to scheduling and traveling constraints, and, potentially, participant fatigue. Scheduling for the interview stage required a high degree of flexibility and repeated contact with participants, thus, the lower focus group participation rates were anticipated. While many participants had expressed an interest in attending, it was difficult to coordinate scheduling among multiple participants for a three-hour period. The original plan for three focus groups was scaled back to one due to the impossibility of ensuring adequate participation rates in each of the focus groups (i.e., more than three participants). Collaboration with the Treaty Office enhanced participation during the final week of focus group planning. Had their assistance been solicited earlier in the process, the original plan of three focus groups may have been more feasible. The concern about the low participation rates prompted the invitation of three youth to join in the process. While this was not an ideal situation, it did lead to a greater representation across age groups. In future applications, a more successful response would require a higher degree of commitment from participants to the process. Alternatively, the study could plan for lower participation rates,

allocate more time for scheduling, or complete multiple focus groups while accepting lower attendance (e.g., two or three participants).

b) Productivity

The major achievement of the focus group was to establish the Tl'azt'en characteristics of effective measures, which had been difficult to explore in a one-on-one setting. The group dynamic encouraged questions and debate, which allowed me to make suggestions based on my knowledge of literature without passive acceptance from participants. The focus group allowed me to identify areas of consensus and heterogeneity of values. As well, I was able to explain the project better in a group setting, where participants could ask questions and help one another understand the objectives and tasks. The forum also allowed community members to mentor youth on explaining community values to an outside person.

An important concept I learned through the focus group was that management and community foci are both necessary for measuring JPRF success, although in different ways. Management-focused measures are clearly under the control of the JPRF, and suggest organizational changes that are needed. Community-focused measures are needed in addition to management measures, as the community feels that the JPRF should aim to improve social conditions in the community. Investigation of community-focused measures and their application is incomplete, and is further exploration is needed.⁵²

c) Conducting a Structured Focus Group

Because this study was based on previously collected information on community values, I chose a more structured form of facilitation in the focus group. This was difficult partially

⁵² It may be possible that the participants felt that community monitoring is the utmost priority, and see this project as an opportunity to develop a community monitoring program through the JPRF.

because group size was unexpectedly large, although I had been concerned about insufficient participation. While group size was reported as acceptable by the focus group, one participant recommended that the group could be divided in two (Table 5.10). Further, three participants were unfamiliar with previous research stages, which necessitated further explanations.

Structured facilitation was also difficult due to my identity in the community. To be respectful in a cross-cultural setting, I could not interrupt participants, and had to be delicate in acknowledging, then redirecting discussions. As a young person and a student, I also had to realize that I did not necessarily have the authority to be overly controlling, regardless of my cross-cultural skills.

I had some concern about the power dynamics within the focus group. I had originally planned for one separate focus group to be held with the community leaders. Having all participants in one group may have impacted the nature of the discussions. The majority of the contributions were made by a minority of the group's members, regardless of my efforts to effectively moderate the group and encourage participation from all present. Although structure was necessary to generate information specifically on measures of cultural revitalization, it was important that participants were able to explore the topic through group discussion to fully understand the concepts and their own perspectives. Participants at times viewed the session as a forum to voice issues and opinions about the JPRF rather than to recommend measures or evaluation approaches. By allowing participants to speak about desired JPRF outcomes more generally, I was able to better achieve participant buy-in and later examine the content for measures ideas. To limit the session to a reasonable length and to allow the group to sufficiently discuss the issues, I was unable to cover the full range of themes. Fortunately, the group did manage to contribute to all themes due to the interconnected nature of the topic.

Analysis of Previously Conducted JPRF Outcomes Interviews

My final step in collecting measures information was to revisit interviews from a previous study on expected co-management outcomes (Sherry *et al.* nd-a). Data had been summarized previously, so only information on cultural revitalization was analyzed for measures. I had concerns about the validity of the data for my line of inquiry, as participants were not asked questions pertaining to evaluation, but to expected JPRF outcomes. This concern was mitigated two ways. Firstly, the previous data generation techniques produced similar results, in that participants discussed desired outcomes during measures interviews (as described on page 157). Secondly, the data was examined taking the Tl'azt'en measures characteristics list into consideration. I identified information relating five of the six themes.⁵³ Considering that this data was the basis for the interview and focus group sessions, a significant amount of overlap was anticipated. While this data did not serve as a significant source of new measures, the data was quite easily incorporated into the analysis. Unlike the other procedures, there was no expense or time required for data generation, yet the information contributes to triangulation.

Analyst Additions

Once all ideas from other methods had been formulated into measures, I examined the overall list and noted obvious gaps. I created three new measures to fill these gaps based on existing measures. For example, the focus group recommended monitoring the number of Dakelh translators in the community who are employed, in comparison to the total number of translators. The added measure was “the number of jobs that require cultural skills”. By generalizing a

⁵³ No measures relating to *Revitalization of Traditional Roles and Governance Systems* emerged from the outcomes interview data.

measure that was specifically recommended, I was able to create a new measure that was clearly in line with participants' interests.

6.3.1.3 Overall Value of the Approach

One measure of the effectiveness of this research is the overall satisfaction of participants with the research. Participants remarked that the measures concept seemed to be an effective method for documenting Tl'azt'en values (Table 5.10). Participants were interested to hear about the research done to date, and were interested in learning more about related projects in the future (Table 5.10).

6.3.2 Comparison to Previous Measures Development Processes

The measures development method created in this thesis is unique in many ways. Critical characteristics include: its basis in empowerment evaluation, the explicit recognition of a personal transformative process, use of locally-defined experts, and precisely defined processes for adapting interview and focus group data into measures. The elements of this method are compared to those described in the literature with similar intents.

6.3.2.1 Personal Transformative Process

My own development was a critical component of this study; thus it was included in the description of the measures development method. Surprisingly, this process was not explicated in other measures development methods examined in the literature. This thesis makes an important contribution by acknowledging personal change as a stage of measures development for non-Aboriginal researchers.

Many who work in cross-cultural settings recognize that researchers and evaluators must adapt their perspectives to those of local people. Effective evaluators must engage in a process of personal change to implement participatory evaluation methods (e.g., Chambers 1997; Smyth 2002; Parkins, Stedman, and Varghese 2001; Parlee and Lutsel K'e First Nation 1997). Recommended strategies and tactics for changing personal beliefs include facilitating the disempowered, changing behavior, making training experiential and interactive, reflecting and sharing, and forming relationships with children (Chambers 1997). Fundamentally, “courtesy, respect, patience, considerations, generosity, reflecting on and being sensitive to others’ realities... such virtues seem the core of personal and interpersonal well-being” (Chambers 1997, pg 233). Researchers who work with Aboriginal communities recognize the importance of the researcher’s personal abilities and skills to ensure effective communication (Sherry 2002; Kirkhart 1995; Smith 1999). Some key personal attributes include credibility and trustworthiness, openness, empathy, flexibility, a democratic leadership style, and a following through with commitments (Sherry 2002). Important community research skills relate to observation, communication, teaching and coordination (Sherry 2002). Unless those involved in measures development acquire community perspectives and critical skills, the methodology cannot be effective.

6.3.2.2 Participant Selection

By combining multiple techniques, the participation selection approach used in this process was more community-based and rigorous than others identified in the literature, and comparably representative. Unfortunately, some authors did not fully explain participant selection; thus it is difficult to ascertain the quality of their procedures (e.g., Alzate 2000).

Through rich description of the participation selection process, this method demonstrates its rigor (Guba and Lincoln 1989).

Representativeness in this study was achieved through delineation of explicit criteria, expert nomination, peer-recommendations and forest actors analysis (Sherry *et al.* nd-b). Other processes used broad participation to achieve representativeness (e.g., Parlee and Lutsel K'e First Nation 1997; Natcher and Hickey 2002a); this requires substantial time and resources for data collection and management. Representation is often ensured through identifying stakeholder groups, and selecting participants who represent them (e.g., Blauert and Quintanar 2000). A specific stakeholder identification approach is the forest actors analysis (as used in this method), which was developed through the Centre for International Forestry Research (Pierce-Colfer, Prabhu, and Wollenberg 1995). This technique was used specifically for measures identification by Pokorny *et al.* (2004), but participant selection was further refined based on the participants' ability to complete specific tasks, reducing participation to four participants. Pokorny *et al.*'s (2004) skill-based selection process reduced community control, and resulted in a smaller group than that of other processes, which may be less representative of community interests. The method developed in this thesis places the technical duties upon the evaluator, eliminating the need to restrict participation based on methodological needs.

This method uses locally-identified experts to focus the data generation process on data quality (Sherry 2002), which also relates to measures development methods in the literature. Parkins, Stedman and Varghese (2001) and Smyth (2002) described the use of community expertise in determining who should participate in measures development processes. Parkins, Stedman and Varghese (2001) consulted "community leaders" to determine which members should represent the community. In another measures development process, community

members came to a “general agreement” that a core group of Elders should participate (Smyth 2002; 2005). This thesis used a more formal community-driven recommendation process, requiring selected participants to achieve multiple nominations, and inviting those selected to submitted further nominations (Sherry *et al.* nd-b).

6.3.2.3 Idea Generation, Measures Formation and Verification

A major contribution of this thesis is the systematic, rigorous approach to the process of community-based measures development. This thesis clearly describes the measures formation process through articulating the lead researcher’s and community’s roles, and ensuring the researcher(s) formulates measures that adhere to community values, perspectives and knowledge systems. The method combines ideas from previous academic and community-focused approaches to produce a new, thorough, community-based approach, which addresses co-management needs by contributing to capacity in the community.

This method is similar to previous processes that emphasize iterative and diverse idea generation processes and demonstrate rigor with reference to academic literature. Parlee and the Lutsel K’e (1997), Parkins, Stedman and Varghese (2001), Smyth (2002), and Natcher and Hickey (2002a) used techniques such as interviews, workshops, surveys and mapping exercises in a range of settings, providing varying levels of capacity building and community involvement. These methods tend to describe the iterative process between community participants and research analysts. For example, Parkins, Stedman and Varghese (2001) define the three stages of their measures development method as holding workshops to generate measures, refinement through application of an indicator evaluation framework, then ranking through surveys. Likewise, this thesis utilizes step-by-step diagrammatic explanations of the method. It diverges

from these previous methods with its greater emphasis on community capacity building (Parkins, Stedman and Varghese 2001).

The ‘measures characteristics’ critical to this thesis method have been used before. Pokorny *et al.* (2004) intensively trained participants, facilitated measures development exercises, then evaluated the measures against a set of criteria. The method in this thesis also uses criteria; however, it is further grounded in community knowledge and values by involving participants in establishment of measures characteristics.

This measures development process also relates to approaches that apply multiple, interactive workshops in the spirit of Participatory Rural Appraisal, where training, group interviews, small group or individual exercises, and verification are utilized (Alzate 2000; Blauert and Quintanar 2000; Sidersky and Guijt 2000; Kotwal and Chandurkar 2003a). These types of methods focus on capacity building, and assign the data analysis and measures formulation tasks to community members, rather than to the lead researcher. Such approaches are often less rigorous, but cultivate organizations’ capacity for monitoring and evaluation. While this thesis has not fully developed Tl'azt'en capacity for leading measures development processes, the organizational capacity among JPRF staff has grown to a point where a rigorous evaluation program can begin. It creates a framework for using the technical expertise from UNBC and JPRF research to engage Tl'azt'en experts.

The verification processes in this method may be insufficient. Pokorny *et al.* (2004) felt that field testing was an essential component of the measures evaluation exercise, particularly for the “local actors” who are not involved in technical aspects of forest management. For Kotwal and Chandurkar (2003a), field verification identified gaps, and additional measures were developed. The majority of identified measures development processes did not include field

verification due to the amount of time and resources required, though the few examples of field verification demonstrate its importance. The verification process used in this thesis is comparable to those used in many academic processes for social/cultural values (e.g., Parlee and Lutsel K'e First Nation 1997; Parkins, Stedman, and Varghese 2001; Natcher and Hickey 2002a; Smyth 2002). Future verification is necessary through in-person discussions of measures findings once information is collected.

7. Future Modifications and Recommendations

7.1 *Limitations*

Limitations of the measures development method created in this thesis relate primarily to concerns about the extent of meaningful participation of Tl'azt'enne in the process. There is some concern that all participants did not fully understand all aspects of the study. I had hoped to develop capacity in participants to enable them to carry out a similar process independently, but it is likely that further training and/or assistance would be required for such a project. It became clear as the research progressed that a significant amount of analysis was required to formulate the measures based on participant input, and that this analysis could not be accomplished by Tl'azt'en participants without a significant amount of training. The thesis research lacked the resources to hire and train community analysts, and, as this was an evolving approach, training would have been extremely challenging for me to deliver at the time. Also, there were no existing personnel within community organizations who were dedicated to this type of work who could assist with the project. As well, it may be that the JPRF's responsibility for cultural revitalization was not a high monitoring priority for project participants, and/or the community. Participants were willing to participate, but enthusiasm for the project was not high.

While Elders' input was integrated into the study through the use of transcripts, the two invited Elders did not participate in the present study. Elders are a particularly important part of the community, and would likely be able to contribute valuable knowledge on measuring cultural revitalization. In terms of general participation, the participation rate for the interviews was acceptable, although participation was limited in the focus group. The original intent of this thesis was that the majority of Tl'azt'en interviewees would be able to attend a focus group; however, low participation meant that the majority of research participants were not involved in

the discussions of other participants ideas about measures, and that they did not have an opportunity to discuss the project in a group setting.

This project would have benefited from greater participant feedback. Feedback was received from the community research coordinator, my thesis supervisory committee, pre-test interviewees, and focus group participants. Feedback on the final measures set was not formally received. Although results were distributed directly to participants through mail and/or email and two community presentations occurred, I was not able to generate substantial critical feedback from participants on the final results and the measures development process.

7.2 *Suggested Modifications*

7.2.1 Prioritization of Criteria

Ensuring the topic under investigation is of high priority for the community would help to bolster participation rates in all stages of the research. Particular emphasis should be placed on the priorities of Elders to ensure their participation. Although a prioritization exercise on the importance of each criterion identified in Sherry *et al.* (2005) was planned prior to the study, the research team considered it inappropriate to ask community members to choose between each criterion as all seemed to represent equally important community values, and thus the team decided to cancel the exercise. However, it may be necessary to determine which criteria are considered primary functions or responsibilities of the research forest, which are considered of immediate priority for monitoring, or which have the greatest potential for community participation (e.g., forest ecosystem condition and function, meaningful Tl'azt'en participation in forest management). Other criteria may be identified as secondary or tertiary responsibilities, and while important for the JPRF to address, they may not be critical for monitoring (e.g., local

economic development, community health and well-being, and cultural revitalization). For example, of highest priority may be those criteria that relate most closely to the JPRF's mandate of forest management, research, education, and demonstration (Grainger, Sherry and Fondahl 2006). Prioritization should also consider community interests and capacity, such as existing community monitoring programs. Priorities could be determined by surveying a select group of TI'azt'enne, JPRF staff, JPRF Board of Directors, or a JPRF research and monitoring team. For example, a JPRF research team comprised of TI'azt'en and UNBC members determined that a subsequent graduate student thesis funded through CURA (currently underway) should focus on culturally important plants and animals.

7.2.2 Approaches to Information Generation

The preliminary measures interviews allowed participants to consider concepts thoughtfully, and proved to be a valuable source of measures. The focus group was a less productive source of measures, was less successful in engaging participants through lower participation rates, and did not fully achieve its goals (reviewing and supplementing measures ideas from the interviews and characteristics of effective measures from the literature).

It will be necessary to gauge the level of capacity, interest, and commitment to participation in the project, and then adjust the method accordingly. In this research project, these factors were a concern from the beginning, but the participant interest was not adequately assessed, which forced modifications to the method late in the research process. This change of plans was a barrier to achieving the research goals, and the adjustments made may not have been as effective as possible. For example, through aiming to involve a large number of participants in the focus group, I reduced the length of time to three hours which was inadequate for completing the tasks and ensuring all participants were comfortable with and prepared for the task. In

retrospect, narrower but more thorough community participation may have enhanced the richness of the results. It is recommended that, in a similar case, rather than ask the same set of interviewees to complete these complex tasks, a smaller, targeted group of community participants should be involved more intensively in the exercises over a longer timeframe (e.g., a series of workshops), and be compensated accordingly (e.g., with honoraria). Participants should be selected based on their analytical abilities, availability and interest in the project.

During these workshops, sufficient time must be allocated for training to thoroughly establish a common understanding of the task at hand, participate in more practice exercises, and ensure all members of the team are committed to and prepared for the tasks required of them. As well, an extended time period would allow for a more thorough review of the projects discussed in literature, the measures they developed, and may allow for exploration of targets.

The levels of capacity greatly impact the potential level of community involvement in the research. For example, a community with higher levels of capacity might require little guidance during the workshops, and use of the literature base might be more intensive. A community with lower capacity might have very little involvement in the analysis, and the lead researcher may need to play a greater role in the analysis or rely more heavily on those closely affiliated with the community (e.g., non-Aboriginal consultants/researchers or employees of the First Nation) and the expertise developed in the literature. It is critical to tailor the method closely to community realities to ensure the optimal level of participation is reached in terms of who is involved in each phase, and the community members' level of involvement. There should be two participant selection processes: one to determine who should be involved in the initial idea generation phase with one-on-one interviews (broader participation), and another to choose who will be involved in the workshop (narrower participation) and to determine how to share the analysis workload

between the workshop participants and the lead researcher. These types of decisions along with project scoping and topic selection will have to be made in collaboration with community members.

7.3 Recommendations for Future JPRF Applications

Although the results of this thesis focused on a specific question, they also give perspectives on how to approach monitoring co-management success. Previous sections have discussed specific results related to my research questions. Having reviewed this information in light of the literature, I have a number of suggestions on how future monitoring should be approached in the case of the JPRF.

Two main purposes exist for monitoring the JPRF. Firstly, monitoring supports adaptive management, enabling the organization to reflect, change, and improve its co-management operations. Aboriginal and participatory approaches to evaluation encourage the use of evaluation not for accountability, finding fault or judging, but to inform and improve management (Symonette 2004). Similarly, participants expressed a reluctance to set expectations for the JPRF, or to criticize. Rather than expecting co-management outcomes, Tl'azt'enne look to the JPRF to be supportive of community needs. JPRF staff members also have expressed some caution regarding the evaluation of the JPRF. Management concerns about reporting of negative results have hindered other processes (e.g., von Mirbach 2000a). Participatory evaluation must have community *and staff* perspectives and support at its core to be successful. The utility of the program must resonate with staff members to be truly effective and sustainable. Secondly, monitoring and evaluation results can be used as communication tools. Many participants in this project expressed a lack of knowledge about JPRF co-management, despite being nominated as

local experts on the process. Community reporting based on locally-identified measures could form the basis of an effective external communication plan.

7.3.1 JPRF Monitoring Recommendations

Firstly, a 'JPRF Evaluation Team' should be assembled. This may consist of JPRF staff, UNBC researchers, Tl'azt'en community members, the Chuzghun Resources Corporation board members, and others with an interest in co-management success. This team should redefine evaluation in the JPRF context, with a focus on adaptive management and community reporting.

Due to complex funding arrangements, there have been a number of research and community projects on monitoring, undertaken by different people for different purposes. An overarching monitoring plan that integrates previous work and utilizes concepts from participatory and empowerment evaluation is necessary for an effective monitoring program.

Once a united vision is established, an inventory of existing monitoring data and tools is required. Projects focused on monitoring the co-management partnership, the land base, and the community need to be reviewed in light of the adaptive management/community reporting paradigm. This review may affect the subsequent recommendations.

Next, the measures developed through this process need to be reviewed by the JPRF Evaluation Team, and prioritized in the context of application to adaptive management and community reporting, as well as the cost of collecting that information. Depending on the Evaluation Team's assessment, additional measures may need to be added. Once preliminary data is collected, the results need to be reported internally to the JPRF staff and Board of Directors, and reported to Tl'azt'enne and UNBC faculty, staff and students. The measures' effectiveness and appropriateness is best assessed using this tangible data. Model forests found that it is best to start collecting data with a partial set of measures to demonstrate progress and to

help build support (von Mirbach 2000b). While continuity is critical for monitoring change over time, measures will need to be continually revisited and adapted based on co-management needs.

There is also potential to make further use of the ‘characteristics of Tl'azt'en measures’, and interview data collected through previous co-management research. These sources should be used by the ‘JPRF Evaluation Team’ to develop measures of remaining non-spatial, management focused criteria and indicators. While suggestions from Tl'azt'en participants formed the basis of the measures found in this study, preliminary measures may be developed by the ‘JPRF Evaluation Team’, and evaluated by the community after data are reported.

Community-focused measures were not sufficiently explored in this study, as it was beyond its scope. A community monitoring project cannot be developed from the JPRF perspective alone; rather, JPRF should continue to support community-driven monitoring projects, such as the Labour Market Partnership study (Hodder and Sherry 2005). Opportunities for forming monitoring partnerships with community groups (e.g., schools, health programs) should also be explored.

7.4 Potential Applications

The measures development method created in this thesis may be useful in a number of related applications, beyond co-management. Additionally, the measures characteristics may be used to evaluate measures developed through different processes, and the measures of cultural revitalization may be used as examples in other cases. In British Columbia, the combined factors of the government’s ‘New Relationship’ with First Nations and ‘results-based’ forest policy necessitate the development of collaborative measures development processes.⁵⁴ The provincial government may find the approach useful for collaboratively generating measures with First

⁵⁴ For more information, see <http://www.for.gov.bc.ca/hfp/frep/values/heritage.htm>.

Nations for specified forest values under the *Forest and Range Practices Act*. Further, eco-certification standards such as the Forest Stewardship Council or the Canadian Standards Association, certifying organizations such as Smartwood, and forest companies pursuing certification may be interested in adapting this measures development approach for their C&I frameworks.

Across Canada, First Nations are gaining increased access to forest tenures (NAFA 2007). As First Nations may be interested in engaging community members and monitoring the effectiveness their own operations, this method may be of interest. Organizations such as the National Aboriginal Forestry Association and the newly established First Nations Forestry Council in British Columbia are becoming increasingly influential, and may be interested in supporting communities in developing local-level measures for their forestry partnerships. Beyond forestry, First Nations may wish to develop measures of success for other community endeavors relating to education, research, or health programs.

7.5 *Summary of Conclusions*

In conclusion, the thesis was successful in achieving each of its three objectives. A measures development method was established, tested, and evaluated; measures of co-management success were generated with Tl'azt'en Nation for the John Prince Research Forest; and characteristics of effective measures were established. The measures development method elaborated in this research involved a personal transformative process, a series of iterative data generation procedures, and a final measures formation step. By evaluating the effectiveness of the method through the case study application, I was able to demonstrate the success of the method and recommend improvements for future applications. Additionally, multiple community benefits resulted from this work, including the production of relevant research results.

References

- Alkin, M. C., ed. 2004. *Evaluation Roots: Tracing Theorists' Views and Influences*. Thousand Oaks: Sage.
- Alzate, R. D. E. 2000. Monitoring and evaluating local development through community participation: The experience of the Association of Indigenous Cabildos of Northern Cauca, Colombia. In *Learning from change: Issues and experiences in participatory monitoring and evaluation*, eds. M. Estrella, J. Blauert, D. Campilan, J. Gaventa, J. Gonsalves, I. Guijt, D. Johnson and R. Ricafort, 95-108. Ottawa: IDRC.
- Anon. 2005. Monitoring SFM Values in the Fort Nelson Defined Forest Area: Development of a Monitoring Program. Report prepared for BC Timber Sales and Canadian Forest Products Ltd., FIA Contract. March 31st, 2005. Available at: http://www.for.gov.bc.ca/hfd/library/FIA/2005/LBIP_2346006b.pdf
- Barbour, R. S., and J. Kitzinger, eds. 1999. *Developing Focus Group Research: Politics, Theory and Practice*. London: Sage.
- Baruah, B. 1998. Sustainable development of rural aboriginal communities of northern British Columbia: a case study of the Tl'azt'en Nation. Unpublished Master's Thesis, Environmental Studies, University of Northern BC, Prince George, BC.
- BC First Nations Leadership Council. 2005. BC First Nations Mountain Pine Beetle Action Plan. Prince George, BC.
- Beckley, T. M. 1998. Moving toward consensus-based forest management: A comparison of industrial, co-managed, community, and small private forests in Canada. *Forestry Chronicle* 74 (5):736-744.
- Beckley, T. M., and T. M. Burkosky. 1999. Social indicator approaches to assessing and monitoring forest community sustainability, Information Report NOR-X-360. Edmonton, AB: Canadian Forest Service, Northern Forestry Centre.
- Beckley, T. M., and D. Korber. 1997. Clear cuts, conflict, and co-management: Experiments in consensus forest management in northwest Saskatchewan. Ottawa, Canada: Canadian Forest Service, Northern Forestry Centre.
- Beckley, T. M., J. R. Parkins, and R. C. Stedman. 2002. Indicators of forest-dependent community sustainability: The evolution of research. *Forestry Chronicle* 78 (3):626-636.
- Bell, S., and S. Morse. 2001. Breaking through the glass ceiling: who really cares about sustainability indicators? *Local Environment* 6 (3):291-309.
- Berkes, F. 1989. *Common Property Resources: Ecology and Community Based Sustainable Development*. London: Belhaven.

- Berkes, F. 1994. Co-management: Bridging the two solitudes. *Northern Perspectives* 22 (2-3):18-20.
- . 1999. *Sacred Ecology: Traditional ecological knowledge and resource management*. Philadelphia, PA: Taylor and Francis.
- Berkes, F., and C. Folke. 1998. *Linking social and ecological systems: management practices and social mechanisms for building resilience*. Cambridge, UK: Cambridge University Press.
- Berkes, F., P. George, and R. J. Preston. 1991. Co-management: The evolution in theory and practice of the joint administration of living resources. *Alternatives* 18 (2):12-18.
- Bickmore, A. K. J. 2002. Evaluating the co-management institutions created by the James Bay and Northern Quebec Agreement and the Inuvialuit Final Agreement with planning criteria. PhD, School of Urban and Regional Planning, Queen's University, Kingston, ON, Canada.
- Bird, B. 2006. Putting Traditional Knowledge into Practice. *CURA Newsletter* 5 (Fall 2006):1-2. Available at: <http://cura.unbc.ca/pubs/FallNewsletter2006.pdf>
- Blauert, J., and E. Quintanar. 2000. Seeking local indicators: participatory stakeholder evaluation of farmer-to-farmer projects, Mexico. In *Learning from change: Issues and experiences in participatory monitoring and evaluation*, eds. M. Estrella, J. Blauert, D. Campilan, J. Gaventa, J. Gonsalves, I. Guijt, D. Johnson and R. Ricafort, 32-49. Ottawa: IDRC.
- Booth, A. 1998. Putting forestry and community back into First Nations resource management. *Forestry Chronicle* 74 (3):347-352.
- Borrini-Feyerabend, G. 1996. *Collaborative management of protected natural areas: Tailoring the approach to the context*. Gland, Switzerland: IUCN.
- Borrini-Feyerabend, G., M. Taghi Farvar, J. C. Mguingui, and V. A. Ndangang. 2000. *Co-management of natural resources: Organising, negotiating, and learning-by doing*. Heidelberg, Germany: GZT and IUCN.
- Boyd, J. 2005. Monitoring Rationale for Values under the SFM Framework; Criterion 8: Sustaining First Nations Values (Quesnel Defined Forest Area), 24p. Vancouver: University of British Columbia.
- Bridge, S., D. Cooligan, D. Dye, L. Moores, T. Niemann, and R. Thompson. 2005. Reviewing Canada's National Framework of Criteria and Indicators of Sustainable Forest Management. *Forestry Chronicle* 81 (1):73-80.
- British Columbia Treaty Commission. 2003. The Business Case for Treaties. Available at: <http://www.bctreaty.net>
- Brody, H. 1981. *Maps and Dreams*. Vancouver: Douglas and McIntyre.

- . 2000. *The other side of Eden*. Vancouver: Douglas and McIntyre.
- Brown, D. 2002. Carrier Sekani self-government in context: land and resources. *Western Geography* 12:21-67.
- Brundtland, G. H. 1987. *Our Common Future*. Oxford: Oxford University Press.
- Canadian Council of Forest Ministers (CCFM). 2003a. *Defining sustainable forest management in Canada: Criteria and indicators, 2003*. Ottawa: Canadian Council of Forest Ministers.
- . 2003b. *National Forest Strategy (2003-2008), A Sustainable Forest: The Canadian Commitment*. Ottawa: Natural Resources Canada, Canadian Forest Service.
- Canadian Criteria and Indicator Task Force. 2003. *Criteria and Indicators 2003: Background Information on the CCFM and C&I Review*. Ottawa: Canadian Council of Forest Ministers.
- Canadian Forest Service. 1999. *Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests, the Montreal Process*. 2nd ed. Ottawa: Canadian Forest Service.
- Carlsson, L., and F. Berkes. 2005. Co-management: concepts and methodological implications. *Journal of Environmental Management* 75 (1):65-76.
- Castaneda, F. 2000. Criteria and indicators for sustainable forest management: International processes, current status and the way ahead. *Unasylva* 51 (203):34-40.
- Chambers, F. G. 1999. Co-management of forest resources in the NorSask Forest Management License Area, Saskatchewan: A case study. Unpublished Master's Thesis, Faculty of Environmental Design, University of Calgary, Calgary, Alberta.
- Chambers, R. 1997. *Whose Reality Counts? Putting the First Last*. London: Intermediate Technology Publications.
- Chan, H. M., and F. Yeboah. 2000. Total toxaphene and specific congeners in fish from the Yukon, Canada. *Chemosphere* 41: 507-515.
- CIFOR C&I Team. 1999. *The CIFOR Criteria and Indicators Generic Template, Criteria and Indicators Toolbox Series*. Jakarta, Indonesia: Center for International Forestry Research (CIFOR).
- Cobb, C. W., and C. Rixford. 1998. Lessons learned from the history of social indicators [monograph on-line]. *Redefining Progress* November 1998. Available at: <http://redefiningprogress.org/newpubs/1998/SocIndHist.pdf>
- Cortex Consultants Inc. 1995. First Nations' Perspectives Relating to Forest Practices Standards in Clayoquot Sound, 74p. Victoria, BC: Clayoquot Sound Scientific Panel.

- Creswell, J. W. 1994. *Research Design. Qualitative, Quantitative, and Mixed Methods Approaches*. Thousand Oaks: Sage Publications.
- Curran, D. 1999. Aboriginal forestry: community management as opportunity, and imperative. *Osgoode Hall Law Journal* 37:711-774.
- Davidson-Hunt, I., and F. Berkes. 2003. Learning as you journey: Anishinaabe perception of social-ecological environments and adaptive learning. *Conservation Ecology* 8 (1):5 [online]. Available at: <http://www.ecologyandsociety.org/vol8/iss1/art5/print.pdf>
- Davis-Case, D. A. 1989. *Community Forestry: Participatory Assessment, Monitoring and Evaluation*. Rome: FAO.
- Davis, A., and J. R. Wagner. 2003. Who knows? On the importance of identifying "experts" when researching local ecological knowledge. *Human Ecology* 31 (3):463-489.
- Delbecq, A. L., A. H. Van de Ven, and D. H. Gustafson. 1975. *Group Techniques for Program Planning*. Glenview, Illinois: Scott, Foresman and Company.
- Duhaime, G., E. Searles, P. J. Usher, H. Myers, and P. Frechette. 2004. Social cohesion and living conditions in the Canadian Arctic: from theory to measurement. *Social Indicators Research* 66:295-317.
- Durie, M., E. Fitzgerald, T. K. Kingi, S. McKinley, and B. Stevenson. 2002. Māori specific outcomes and indicators [report on-line]. Wellington, New Zealand: Te Putahi a Toi School of Māori Studies, Massey University, Palmerston North [cited June 28th, 2007]. Available at: http://www.tpk.govt.nz/publications/research_reports/outcomes.doc
- Elias, P. D. 1991. *Development of Aboriginal People's Communities*. North York, Canada: Captus Press.
- . nd. Excerpted from the First Iteration of a Document entitled "Prologue: Algonquins of Barriere Lake". Unpublished document, received June 2005, copy held by S. Quinn.
- Estrella, M., J. Blauert, D. Campilan, J. Gaventa, J. Gonsalves, I. Guijt, D. Johnson, and R. Ricafort, eds. 2000. *Learning from Change: Issues and Experiences in Participatory Monitoring and Evaluation*. Ottawa: IDRC.
- Estrella, M., and J. Gaventa. 1998. Who counts reality? Participatory monitoring and evaluation: a literature review. *IDS Working Paper*, 70: Institute of Development Studies.
- Fetterman, D. M., and A. Wandersman, eds. 2005. *Empowerment Evaluation Principles in Practice*. New York: Guilford.
- Fisher, R. J. 1995. *Issues in Forest Conservation: Collaborative Management of Forests for Conservation and Development*. Bellegarde, France: International Union for the Conservation of Nature and Natural Resources and World Wide Fund for Nature.

- Folke, C., S. Carpenter, T. Elmqvist, L. Gunderson, C. S. Holling, and B. Walker. 2002. Resilience and sustainable development: building adaptive capacity in a world of transformations. *Ambio* 31 (5):437-440.
- Fondahl, G, and D. Atkinson. 2007. Remaking space in north-central British Columbia. *BC Studies*, 152(Summer 2007):67-95.
- Forest Stewardship Council Canada (FSC Canada). 2004. National Boreal Standard, 181: Forest Stewardship Council.
- . 2005. Revisions to the Preliminary FSC-BC Regional Standard Approved by the BC Steering Committee and FSC Canada Board, 86. Toronto: Forest Stewardship Council Canada.
- Forest Stewardship Council International (FSC International). 2005. *Forest Stewardship Council Policy and Standards*. Forest Stewardship Council International 2005 [cited June 28 2007]. Available from http://www.fsc.org/en/about/policy_standards/princ_criteria
- Furniss, E. 2004. The Carrier and the Politics of History. In *Native Peoples: the Canadian Experience*, eds. R. B. Morrison and C. R. Wilson, 198-223. Don Mills: Oxford.
- Goldschmidt, P. 1996. A comprehensive study of the ethical, legal, and social implications of advances in biomedical and behavioural research and technology. In *Gazing Into the Oracle: The Delphi Method and its Application to Social Policy and Public Health*, eds. M. Alder and E. Ziglio, 89-132. London, PA: Jessica Kingsley Publishers.
- Government of British Columbia. 2006. *The New Relationship*. Government of British Columbia 2005 [cited June 28th, 2007]. Available at: http://www.gov.bc.ca/arr/down/new_relationship.pdf
- Grainger, S., E. E. Sherry, and G. Fondahl. 2006. The John Prince Research Forest: Evolution of a co-management partnership in northern British Columbia. *Forestry Chronicle*, 82(4):484-495.
- Guba, E. G., and Y. S. Lincoln, eds. 1989. *Fourth Generation Evaluation*. Newbury Park, Calif.: Sage.
- Guba, E. G., and Y. S. Lincoln. 1985. *Naturalistic Inquiry*. New York: Sage.
- Guest, G., A. Bunce, and L. Johnson. 2006. How many interviews are enough? An experiment with data saturation and variability. *Field Methods*, 18(1):59-82.
- Guijt, I. 1999. Participatory Monitoring and Evaluation for Natural Resource Management and Research. In *Socio-economic Methodologies for Natural Resources Research*, 22. Chatham, UK: Natural Resources Institute.
- . 2000. Methodological Issues in Participatory Monitoring and Evaluation. In *Learning from Change: Issues and Experiences in Participatory Monitoring and Evaluation*, eds.

- M. Estrella, J. Blauert, D. Campilan, J. Gaventa, J. Gonsalves, I. Guijt, D. Johnson and R. Ricafort, 201-216. Ottawa: IDRC.
- Harris, C. R. 2002. *Making Native Space: Colonialism, Resistance, and Reserves in British Columbia*. Vancouver: UBC Press.
- Hart, M. 1999. *Guide to Sustainable Community Indicators*. 2nd ed. North Andover, MA: Hart Environmental Data.
- Hausman, A. J., R. Brawer, J. Becker, R. Foster-Drain, C. Sudler, R. Wilcox, and B. J. Terry. 2005. The value template process: a participatory evaluation method for community health partnerships. *Journal of Public Health Management Practice* 11 (1):65-71.
- Hawkes, S. L. E. 1995. Co-management and Protected areas in Canada: The case of Gwaii Haanas. Unpublished Master's Thesis, School of Resource and Environmental Management, Simon Fraser University, Burnaby, Canada.
- . 1996. The Gwaii Haanas Agreement: From conflict to co-operation. *Environments* 23 (2):87-100.
- Hickey, C. G., and M. Nelson. 2005. Partnerships between First Nations and the Forest Sector: a National Survey. Edmonton, AB: Sustainable Forest Management Network.
- Hiebert, B. F., and J. B. Waatainen. 2004. Haida Nation v. British Columbia (Ministry of Forests) - The Ruling of the Supreme Court of Canada. *Davis & Company Forestry Bulletin* 1 (4):1-8.
- Hoberg, G., and E. Morawski. 1997. Policy change through sector intersection: forest and aboriginal policy in Clayoquot Sound. *Canadian Public Administration-Administration Publique Du Canada* 40 (3):387-414.
- Hodder, D., and E. E. Sherry. 2005. Labour Market Issues within the Tl'azt'en Nation Economy: Identifying Strategies for Human Resource Development. Unpublished report for the John Prince Research Forest and University of Northern BC.
- Holling, C. S. 1978. *Adaptive Environmental Assessment and Management*. London: John Wiley & Sons.
- Hopson, R. K., K. J. Lucas, and J. A. Peterson. 2000. HIV/AIDS talk: Implications for prevention intervention and evaluation. In *How and Why Language Matters in Evaluation*, ed. R. K. Hopson, 29-42. San Francisco: Jossey-Bass.
- Hudson, D. R. 1983. *Traplines and Timber: Social and Economic Change Among the Carrier Indians of Northern British Columbia*. Ottawa: National Library of Canada.
- International Tropical Timber Organization (ITTO). 2005. Revised ITTO Criteria and Indicators for the Sustainable Management of Tropical Forests including Reporting Format. In *ITTO*

Policy Development Series. Yokohama, Japan: International Tropical Timber Organization.

- Jackson, E. T. 1998. Indicators of Change: Results-Based Management and Participatory Evaluation. In *Knowledge Shared*, eds. E. T. Jackson and Y. Kassam, 208-222. Bloomfield, CT: Kumarian Press.
- Jentoft, S. 1989. Fisheries co-management: delegating government responsibility to fishermen's organizations. *Marine Policy* 13 (2):137-154.
- Johnson, P. J., and T. M. Borgiel. 2003. CSA's SFM program: Market access through sustainable forest management. *Forestry Chronicle* 79 (6):1060-1066.
- Johnson, R. B. 1997. Examining the validity structure of qualitative research. *Education* 118 (2):282-292.
- Kant, S., and Y. Zhang. 2002. Co-management of Forest Resources in Canada: An Economically Optimal Institutional Arrangement. Edmonton, AB: Sustainable Forest Management Network.
- Karjala, M. 2001. Integrating Aboriginal Values Into Strategic-Level Forest Planning on the John Prince Research Forest, Central Interior, British Columbia. Unpublished Master's Thesis, Natural Resources and Environmental Studies, University of Northern BC, Prince George, BC.
- Karjala, M., E. E. Sherry, and S. M. Dewhurst. 2003. *The Aboriginal Forest Planning Process: A Guidebook for Identifying Community-Level Criteria and Indicators*. Prince George, BC: University of Northern British Columbia.
- Karjala, M. K., and S. M. Dewhurst. 2003. Including aboriginal issues in forest planning: a case study in central interior British Columbia, Canada. *Landscape and Urban Planning* 64 (1-2):1-17.
- Karjala, M. K., S. M. Dewhurst, and S. Grainger. 2003. Cooperative forest planning using criteria, indicators and systems analysis. In *Systems analysis in forest resources*, eds. G. J. Arthaud and T. M. Barrett, 123-125. The Netherlands: Kluwer.
- Karjala, M. K., E. E. Sherry, and S. M. Dewhurst. 2004. Criteria and indicators for sustainable forest planning: a framework for recording Aboriginal resource and social values. *Forest Policy and Economics* 6 (2):95-110.
- Kessler, W., S. M. Dewhurst, A. Booth, M. K. Karjala, M. MacGregor, and E. E. Sherry. 2001. Evaluation of the "Echo" System and Scenario Planning for Sustainable Forest Management. Edmonton, Alberta: Sustainable Forest Management Network.
- Kirkhart, K. 1995. Seeking multicultural validity: a postcard from the road. *Evaluation Practice* 16 (1):1-12.

- Knodel, J. 1993. The design and analysis of focus group studies. In *Successful Focus Groups*, ed. D. L. Morgan, 35-50. London: Sage.
- Kofinas, G. P. 1998. The costs of power sharing: Community involvement in Canadian Porcupine caribou management. Unpublished Doctoral Dissertation, University of British Columbia, Vancouver.
- Kosek, J. 1993. Ethics, Economics and Ecosystems. *Cultural Survival Quarterly* 17 (1).
- Kothari, A. 1996. India's protected areas: The journey to joint management. *World Conservation* 2:8-9.
- Kotwal, P. C., and D. Chandurkar. 2003a. Indigenous measures of sustainability: developing local-level criteria and indicators. Paper read at International Conference on the Contribution of Criteria and Indicators for Sustainable Forest Management: The Way Forward (CICI-2003), 3-7 February, at Guatemala City [cited June 28th 2007]. Available at: <http://www.fao.org/DOCREP/005/J0077E/J0077E09.htm>
- . 2003b. Operational model of adaptive co-management of Indian forests based on criteria and indicators, 11. Nehru Nagar, India: Indian Institute of Forest Management.
- Kowalsky, L. O., M. J. Verhoef, W. E. Thurston, and G. E. Rutherford. 1996. Guidelines for entry into an Aboriginal community. *Canadian Journal of Native Studies* 16 (2):267-282.
- Kruse, J., D. Klein, S. Braund, L. Moorehead, and B. Simeone. 1998. Co-management of natural resources: A comparison of two caribou management systems. *Human Organization* 57 (4):447-458.
- LaFrance, J. 2004. Culturally competent evaluation in Indian country. *New Directions for Evaluation* 2004 (102):39-50.
- . 2005. Framing an Indigenous Approach to Evaluation. Paper read at Aboriginal Educational Research Forum, June 1-3, 2005, Winnipeg, MB.
- Lammerts van Bueren, E. M. L., and E. M. Blom. 1997. *Hierarchical Framework for the Formulation of Sustainable Forest Management Standards*. Leiden, the Netherlands: Tropenbos Foundation.
- Lantz, P. M., E. Viruell-Fuentes, B. A. Israel, D. Softley, and R. Guzman. 2001. Can communities and academia work together on public health research? Evaluation results from a community-based participatory research partnership in Detroit. *Journal of Urban Health* 78 (3):495-507.
- Lincoln, Y. S., and E. G. Guba. 2004. The Roots of Fourth Generations Evaluation: Theoretical and Methodological Origins. In *Evaluation Roots: Tracing Theorists' Vies and Influences*, ed. M. C. Alkin, 225-242. Thousand Oaks: Sage.

- MacKendrick, N., and J. R. Parkins. 2004. Indicators of Community Sustainability for the Morice and Lakes IFPA Region. Edmonton, AB: Natural Resources Canada, Canadian Forest Service.
- McGregor, D. 2002. Indigenous knowledge in sustainable forest management: community-based approaches achieve greater success. *Forestry Chronicle* 78 (6):833-836.
- Mendoza, G. A., and R. Prabhu. 2000. Development of a methodology for selecting criteria and indicators of sustainable forest management: a case study on participatory assessment. *Environmental Management* 26 (6):659-673.
- . 2003. Qualitative multi-criteria approaches to assessing indicators of sustainable forest resource management. *Forest Ecology and Management* 174 (1-3):329-343.
- . 2005. Combining participatory modeling and multi-criteria analysis for community-based forest management. *Forest Ecology and Management* 207 (1-2):145-156.
- Merryfield, M. M. 1985. The challenge of cross-cultural evaluation: Some views from the field. In *Culture and Evaluation*, ed. M. Q. Patton, 3-18. San Francisco: Jossey-Boss.
- Mills, Antonia. 1994. *Eagle Down is Our Law: the Witsuwit'en Law, Feasts, and Land Claims*. Vancouver: UBC Press.
- Ministerial Conference on the Protection of Forests in Europe (MCPFE). 2002. Improved Pan-European Indicators for Sustainable Forest Management as adopted by the MCPFR Expert Level Meeting 7-8 October 2002, Vienna, Austria. Vienna: Ministerial Conference on the Protection of Forests in Europe [cited June 28, 2007]. Available at: http://www.mcpfe.org/publications/pdf/improved_indicators.pdf
- Mitchell, R. 2003 Yunk'ut Whe Ts'o Duleh (We Learn from our Land): Discussion Paper & Curriculum Development for an Outdoor Education Culture-based Science Camp. Unpublished report for the John Prince Research Forest.
- Monitoring SFM Values in the Fort Nelson Defined Forest Area: Development of a Monitoring Program, the Fort Nelson SFM Plan. 2005. 120. Fort Nelson, BC: British Columbia Timber Sales and Canadian Forest Products.
- Morgan, J.P. 1993. Cooperative management of wildlife in northern Canadian National Parks. Unpublished Master's Thesis, University of Calgary, Calgary, Alberta, Canada.
- Morgan, D. L. 2002. Focus Group Interviewing. In *Handbook of Interview Research*, eds. J. F. Gubrium and J. A. Holstein, 141-160. Thousand Oaks, CA: Sage.
- Morris, P. 1999a. History of the Establishment of Tree Farm License 42. In *Linking Forestry and Community in the Tl'azt'en Nation: Lessons for Aboriginal Forestry*, 35. Prince George, British Columbia: Forest Renewal British Columbia. University of Northern BC.

- . 1999b. Negotiating the production of space in Tl'azt'en territory, 1969-1984. MA, Geography, University of Northern BC, Prince George.
- Morris, P., and G. Fondahl. 2002. Negotiating the production of space in Tl'azt'en territory, Northern British Columbia. *Canadian Geographer* 46 (2):108-125.
- Natcher, D. C. 2000. *Co-operative resource management as an adaptive strategy for aboriginal communities the Whitefish Lake First Nation case study*. Ottawa: National Library of Canada. [Microform]
- Natcher, D. C., and C. G. Hickey. 2002a. Putting the community back into community-based resource management: A criteria and indicators approach to sustainability. *Human Organization* 61 (4):350-363.
- . 2002b. A Criteria and Indicators Approach to Community Development. Working Paper 2002-2. Sustainable Forest Management Network: Edmonton, AB.
- . 2004. Developing a procedural framework for community-based forestry in the Kaska traditional territory. *Journal of the Community-Based Research Consortium* 2 (Spring 2004):1-10.
- National Aboriginal Forestry Association (NAFA). 1997a. *An aboriginal criterion for sustainable forest management*. Ottawa: National Aboriginal Forestry Association.
- . 1997b. *Aboriginal participation in forest management: not just another stakeholder*. Ottawa: National Aboriginal Forestry Association.
- . 2006. Summary of Proceedings: National Forest Strategy Team 3 Working Meeting, April 5-6, 2006, at Ottawa.
- . 2007. *Second Report on First Nation-Held Forest Tenures in Canada*. Ottawa: National Aboriginal Forestry Association.
- National Aboriginal Forestry Association (NAFA), and the Institute on Governance. 2000. *Aboriginal-forest sector partnerships: lessons for future collaboration*, 85. Ottawa, ON: National Aboriginal Forestry Association (NAFA) and the Institute on Governance.
- National Forest Strategy Coalition. 2003. *National Forest Strategy (2003-2008), A Sustainable Forest: The Canadian Commitment*.
- Natural Resources Canada. 2002. *Waswanipi Cree Model Forest - Phase II: Evaluation Report*, 20. Ottawa: Natural Resources Canada, Audit and Evaluation Branch.
- Northern Lights Heritage Services, and L. Larcombe Archaeological Consulting. 1999. *Criteria and indicators for naturalized knowledge*. Report prepared for the Prince Albert Model Forest and the Naturalized Knowledge Working Group.

- Notzke, C. 1994. *Aboriginal peoples and natural resources in Canada*. North York, Canada: Captus University.
- . 1995. A new perspective in Aboriginal natural resource management: co-management. *Geoforum* 26 (2):187-209.
- O'Fallon, Liam R., and Allen Dearry. 2005. Community-based participatory research as a tool to advance environmental health sciences. *Environmental Health Perspectives* 110 (suppl. 2): 155-159.
- Olsson, P., C. Folke, and F. Berkes. 2004. Adaptive co-management for building resilience in socio-ecological systems. *Environmental Management* 34 (1):75-90.
- Osherenko, G. 1988. *Sharing Power with Native Users: Co-management Regimes for Arctic Wildlife*. Ottawa, Canada: Canadian Arctic Resources Committee.
- Parkins, J. R., and T. M. Beckley. 2001. Monitoring community sustainability in the Foothills Model Forest: a social indicators approach. Report prepared for the Canadian Forest Service, Atlantic Forestry Centre.
- Parkins, J. R., R. C. Stedman, and J. Varghese. 2001. Moving towards local-level indicators of sustainability in forest-based communities: A mixed-method approach. *Social Indicators Research* 56 (1):43-72.
- Parkins, J. R., J. Varghese, and R. C. Stedman. 2001. Locally defined indicators of community sustainability in the Prince Albert Model Forest. Prince Albert, SK and Edmonton, AB: Prince Albert Model Forest and Northern Forestry Centre.
- Parlee, B., and Lutsel K'e First Nation. 1997. Community Based Monitoring. Annual Report 1996/97, 63: Lutsel K'e First Nation.
- Parsons, R., and G. Prest. 2003. Aboriginal forestry in Canada. *Forestry Chronicle* 79 (4):779-784.
- Patton, M. Q. 1990. *Qualitative Evaluation and Research Methods*. 2nd ed. Newbury Park, CA: Sage.
- . 2002. *Qualitative Research and Evaluation Methods*. 3rd ed. Thousand Oaks: Sage.
- Paulson, D. D. 1998. Collaborative management of public rangeland in Wyoming: lessons in co-management. *Professional Geographer* 50 (3):301-303.
- Peachey, V. 2002. A Catalogue and Analysis of Forest Stewardship Council Regional Standards for Principle #3, Indigenous Peoples' Rights, 71. Toronto, ON: Forest Stewardship Council of Canada (FSC).
- Pelletier, M. 2002. Enhancing Cree Participation by Improving the Forest Management Planning Process, 32. Report prepared for the Waswanipi Cree Model Forest.

- Pierce Colfer, C. J., R. Prabhu, and E. Wollenberg. 1995. Principles, Criteria, and Indicators: Applying Ockham's Razor to the People-Forestry Link. Jakarta, Indonesia: Centre for International Forestry Research.
- Pinkerton, E. 1989. *Co-operative Management of Local Fisheries: New Directions for Improved Management and Community Development*. Vancouver, Canada: UBC Press.
- . 1992. Translating legal rights into management practice: Overcoming barriers to the exercise of co-management. *Human Organization* 51 (4):330-341.
- Plummer, R., and J. FitzGibbon. 2004. Some observations on the terminology in co-operative environmental management. *Journal of Environmental Management* 70 (1):63-72.
- Pokorny, B., R. Prabhu, C. McDougall, and R. Bauch. 2004. Local stakeholders' participation in developing criteria and indicators for sustainable forest management. *Journal of Forestry* 102 (1):35-40.
- Powell, C. 2002. The Delphi technique: myths and realities. *Methodological Issues in Nursing Research* 41 (4):376-382.
- Prabhu, R. 1999. Criteria and indicators for sustainable forest management: a global overview. Paper read at Proceedings of the National Technical Workshop (under Bhopal-India Process of SFM) on Evolving Criteria and Indicators for Sustainable Forest Management, January 21-23, 1999, at Bhopal, India.
- Prabhu, R., C. Colfer, and G. Shepard. 1998. Criteria and indicators for sustainable forest management: new findings from CIFOR's forest management unit level research. In *Rural Development Forestry Network*. Jakarta, Indonesia: Centre for International Forestry Research.
- Prabhu, R., C. Colfer, P. Venkateswarlu, L. C. Tan, R. Soekmadi, and E. Wellenbery. 1996. Testing Criteria and Indicators for the Sustainable Management of Forests: Phase 1 Final Report. Jakarta, Indonesia: Centre for International Forestry Research.
- Rallis, S. F., and G. B. Rossman. 2003. Mixed Methods in Evaluation Contexts: a Pragmatic Framework. In *Handbook of Mixed Methods in Social and Behavioral Research*, eds. A. Tashakkori and C. Teddlie. Thousand Oaks, CA: Sage.
- Richardson, M., and B. Green. 1989. The fisheries Co-management Initiative in Haida Gwaii. In *Cooperative management of local fisheries*, ed. E. Pinkerton, 249-261. Vancouver, BC: UBC Press.
- Robertson, T. 2002. Waswanipi Cree Model Forest: a case study. Unpublished assignment for *Aboriginal Geography* (GEOG 403), University of Northern BC.
- Ross, M., and P. Smith. 2002. Accommodation of Aboriginal Rights: the Need for an Aboriginal Forest Tenure. Edmonton, Alberta: Sustainable Forest Management Network.

- Rossi, P., M. W. Lipsey, and H. E. Freeman. 2004. *Evaluation: a Systematic Approach*. 7th ed. Thousand Oaks, CA: Sage.
- Ryen, A. 2002. Cross Cultural Interviewing. In *Handbook of Interview Research*, eds. J. F. Gubrium and J. A. Holstein, 335-354. Thousand Oaks, CA: Sage.
- Secret, M., A. Jordan, and J. Ford. 1999. Empowerment evaluation as a social work strategy. *Health and Social Work* 24 (2):120-127.
- Sekher, M. 2001. Organized participatory resource management: insights from community forestry practices in India. *Forest Policy and Economics* 3 (3-4):137-154.
- Sherry, E. E. 2002. Constructing partnership: A Delphi study of shared resources management in the northern Yukon. Unpublished Doctoral Dissertation, Natural Resources and Environmental Studies, University of Northern British Columbia, Prince George, Canada.
- Sherry, E. E., and H. M. Myers. 2002. Traditional environmental knowledge in practice. *Society and Natural Resources* 15:345-358.
- Sherry, E. E., and G. Fondahl. 2003. Criteria Affecting the Success of Co-management: New directions for improved forest management partnerships in British Columbia. Unpublished report for the Forestry Innovation Investment and University of Northern British Columbia.
- . 2004. Methods for Developing Local-Level Criteria and Indicators of Joint Forest Management. Unpublished report for the Forestry Innovation Investment and University of Northern BC.
- Sherry, E. E., G. Fondahl, R. Halseth, S. Parsons, and B. Leon. 2004. Local-level Criteria and Indicators of Sustainable Co-management. Unpublished report for the Forestry Innovation Investment and University of Northern BC.
- Sherry, E. E., R. Halseth, G. Fondahl, M. K. Karjala, and B. Leon. 2005. Local-level criteria and indicators: An Aboriginal perspective on sustainable forest management. *Forestry* 78 (5):513-539.
- Sherry, E. E., M. K. Karjala, and S. M. Dewhurst. 2005. Aboriginal Forest Planning: Lessons from Three Community Pilot Projects. *Canadian Journal of Native Studies* XXV (1(2005)):51-91.
- Sherry, E. E., S. E. Quinn, B. John, S. Grainger and G. Fondahl. nd-a. Moving towards adaptive co-management: A participatory framework for assessing forest co-management results and impacts. (*in preparation*)
- Sherry, E. E., S. E. Quinn, G. Fondahl, B. John and S. Grainger. nd-b. Participatory monitoring and evaluation of resource co-management: A method for generating locally defined criteria and indicators of co-management success. (*in preparation*)

- Sherry, E. E., B. John, G. Fondahl, B. Bird, S. Quinn, S. Grainger, A. Stark. nd-c. Building a collaborative research partnership: Lessons from a First Nation-university alliance. (*in preparation*)
- Shuter, J., S. Kant, and P. Smith. 2005. A multi-level typology for the classification and comparative evaluation of Aboriginal co-management agreements in the forest sector. Edmonton, AB: Sustainable Forest Management Network.
- Sidersky, P., and I. Guijt. 2000. Experimenting with participatory monitoring in north-east Brazil: the case of AS-PTA's Projeto Paraíba. In *Learning from Change: Issues and Experiences in Participatory Monitoring and Evaluation*, eds. M. Estrella, J. Blauert, D. Campilan, J. Gaventa, J. Gonsalves, I. Guijt, D. Johnson and R. Ricafort, 68-82. Ottawa: IDRC.
- Simula, M. 2003. Criteria and Indicators for Sustainable Forest Management: Overview of Progress and Issues. Paper read at International Conference on the Contribution of Criteria and Indicators for Sustainable Forest Management: The Way Forward, 3-7 February 2003, at Guatemala City, Guatemala.
- Singleton, S. 1998. *Constructing Cooperation: the Evolution of Institutions of Co-management*. Ann Arbor: University of Michigan Press.
- Smith, L. T. 1999. *Decolonizing Methodologies: Research and Indigenous Peoples*. London, Ontario: Zed Books.
- Smith, P., and S. Allen. 2005. First Nations & Sustainable Forestry: Institutional Conditions for Success Annotated Bibliography, 188. Edmonton, AB: Sustainable Forest Management Network.
- Smyth, D. 2002. Indicating culture. Unpublished report for Rainforest CRC Project prepared by Smyth and Bahrtdt Consultants, Atherton, Queensland.
- Smyth, D., and C. Beeron. 2001. Development of Cultural Indicators for the Management of The Wet Tropics World Heritage Area. Paper read at The Power of Knowledge, the Resonance of Tradition - Indigenous Studies: Conference 2001, September 18-20, 2001, at The Australian National University, Canberra.
- Symonette, H. 2004. Walking pathways toward becoming a culturally competent evaluator: boundaries, borderlands, and border crossings. *New Directions for Evaluation* 2004 (102):92-109.
- Tashakkori, A., and C. Teddlie. 2003. Major Issues and Controversies in the Use of Mixed Methods in the Social and Behavioral Sciences. In *Handbook of Mixed Methods in Social and Behavioral Research*, eds. A. Tashakkori and C. Teddlie, 3-50. Thousand Oaks, CA: Sage.

- Torres D., V. H. 2000. Monitoring Local Development with Communities: The SISDEL Approach in Ecuador. In *Learning from change: issues and experiences in participatory monitoring and evaluation*, ed. M. Estrella, 109-123. Ottawa: IDRC.
- Treseder, L., and N. Krogman. 2000. Annotated Bibliography Effective Partnerships: Institutions for Shared Forest Management and Community Development. Edmonton, AB: Sustainable Forest Management Network.
- . 2002. Forest co-management in Northern Alberta: does it challenge the industrial model? *International Journal of Environment and Sustainable Development* 1 (3):210-223.
- Ukaga, O. 2001. Participatory evaluation of sustainable development. *Greener Management International* 36:27-36.
- United Nations Conference on Environment and Development (UNCED). 1993. *Agenda 21: programme of action for sustainable development ; Rio Declaration on Environment and Development ; Statement of Forest Principles : the final text of agreements negotiated by governments at the United Nations Conference on Environment and Development (UNCED), 3-14 June 1992, Rio de Janeiro, Brazil*. New York: United Nations Department of Public Information.
- Volta, G., and A. Servida. 1992. Environmental indicators and measurement. In *Environmental Impact Assessment*, ed. A. G. Colombo, 181-188. London: Kluwer Academic Publishers.
- von Mirbach, M. 2000a. Reporting on Local Level Indicators: Barriers and Solutions, 16. Corner Brook, NL: Western Newfoundland Model Forest.
- . 2000b. *A User's Guide to Local Level Indicators of Sustainable Forest Management: Experiences from the Canadian Model Forest Network*. Ottawa: Natural Resources Canada.
- Waitakere City Council. 2004. Waitakere City Wellbeing Report, 119. Waitakere, New Zealand: Waitakere City Council.
- Walter, G. R., and O. Wilkerson, L. 1998. Community sustainability auditing. *Journal of Environmental Planning and Management* 41 (6):673-691.
- Walters, C. J. 2001. *Adaptive management of renewable resources*. 2nd ed. New York: McMillan.
- Warren, J.L. 1997. 'How Do We Know What is Sustainable? A Retrospective and Prospective View'. In *Principles of Sustainable Development*, ed. F.D. Muchette, 131-49. Delray Beach, FL: St. Lucie Press.
- Walters, C. J., and C. S. Holling. 1990. Large-Scale Management Experiments and Learning by Doing. *Ecology* 71 (6):2060-2068.

- Waswanipi Cree Model Forest. *Structure of the WCMF (Waswanipi Cree Model Forest)* 2004 [cited June 28 2007]. Available from <http://collections.ic.gc.ca/waswanipi/PAGE%201-6.HTML>.
- Weaver, H. N. 1999. Assessing the needs of Native American communities: a Northeastern example. *Evaluation and Program Planning* 22:155-161.
- Wilkerson, O., L., and B. Baruah. 2000. Organized complexity, information, and state-of-sustainability reporting: a study of the Tl'azt'en Nation. *Western Geography* 10/11 (2000/01):64-88.
- Wolfe, D. S. 2003. Morice Timber Supply Area Preliminary Social and Economic Values. Report prepared for the Morice and Lakes Innovative Forest Practices Agreement by Tesera Systems Inc.
- Woodley, S., G. Alward, L. I. Gutierrez, T. W. Hoekstra, B. Holt, L. Livingston, J. Loo, A. Skibiki, C. Williams, and P. Wright. 1999. North American Test of Criteria and Indicators of Sustainable Forestry, 161. Washington: USDA, Forest Service, Inventory and Monitoring Institute.
- Wright, P. 1999. Work Plan for the Monitoring Program of the Scientific Panel for Sustainable Ecosystem Management in Clayoquot Sound, 101. Unpublished report for the Long Beach Model Forest Society and Clayoquot Biosphere Project.
- Wright, P., G. Alward, T. W. Hoekstra, B. Tegler, and M. Turner. 2002. Monitoring for Forest Management Unit Scale Sustainability: The Local Unit Criteria and Indicators Development (LUCID) Test. Fort Collins, CO: USDA Forest Service.
- Yin, R. K. 1994. *Case Study Research: Design and Methods*. 2nd ed. Vol. 5, *Applied Social Research Methods Series*. Thousand Oaks, CA: Sage.

Appendix 1: Measures Interview Questions and Focus Group Outline

Theme A: Tl'azt'en Management Systems and Perspectives

Measures of Cultural Revitalization on the JPRF

Interview Questions

From our previous interviews, we learned how important it is for the JPRF to incorporate Tl'azt'en management systems and perspectives into co-management. This interview is intended to develop Tl'azt'en measures of this value. Your answers will help us understand how you think the JPRF should be assessed in terms of achieving a Tl'azt'en vision of good forest co-management.

- 1) People told us that the JPRF should respect traditional forms of governance, like the *balhats* system, the clan system and the *keyoh* system. How would you know if the JPRF is showing enough respect for traditional forms of governance?
- 2) We were also told that the JPRF should respect *keyoh* holders. How could you tell if the JPRF is doing a good job of respecting *keyoh* holders?
- 3) Many people said it was important to involve Elders. How would you check to see if the JPRF is successfully involving Elders?
- 4) People also said it was important to involve community members. How would you determine if community members were involved?
- 5) We learned that the JPRF can support Tl'azt'en culture by using Dakelh language and place names. How would you know if the JPRF is doing a good job of using Dakelh and Tl'azt'en place names?

Theme B: Community Well-being Measures of Cultural Revitalization on the JPRF

Interview Questions

From our previous interviews, we learned how important it is for the JPRF to contribute to community well-being. This interview is intended to develop Tl'azt'en measures of this value. Your answers will help us understand how you think the JPRF should be assessed in terms of achieving a Tl'azt'en vision of good forest co-management.

- 1) The JPRF is also expected to help promote a sense of cultural identity in Tl'azt'enne. How can you tell if the JPRF is doing a good job of promoting cultural identity?
- 2) For individual Tl'azt'enne, the JPRF should help promote a sense of worth and self-esteem. How do you know if the JPRF is going a good job of achieving this goal?
- 3) Many people said that the JPRF needs to increase pride in Tl'azt'en culture. How do you know if the JPRF is doing enough to promote pride in Tl'azt'en culture?
- 4) People expressed to us that the JPRF should support a sense of community, including connections between younger and older generations. How do you know if JPRF is successfully promoting community togetherness and unity?
- 5) We were told that Tl'azt'enne should feel empowered because of the JPRF. How would you evaluate the JPRF's success in promoting sense of empowerment?
- 6) For the Tl'azt'en community, the JPRF is expected to promote a sense of well-being and optimism. How should we measure the success of the JPRF on this task?

Theme C: Cultural Programs and Activities Measures of Cultural Revitalization on the JPRF

Interview Questions

From our previous interviews, we learned how important it is for JPRF programs and activities be based in Tl'azt'en culture. This interview is intended to develop Tl'azt'en measures of this value. Your answers will help us understand how you think the JPRF should be assessed in terms of achieving a Tl'azt'en vision of good forest co-management.

- 1) Many people want the JPRF to support the teaching of traditional land use. How would you determine if the JPRF is successfully supporting the teaching of traditional land use?
- 2) We also learned that people would like the JPRF to support the teaching of the Dakelh language. How would you measure the success of the JPRF in supporting the teaching of Dakelh?
- 3) People told us that the JPRF needs to support programs that teach traditional knowledge and values. How would you determine if JPRF programs have been successful in supporting the teaching of traditional knowledge and values?
- 4) We heard through our interview that people would like the JPRF to help restore traditional trails on the research forest. How do you know if the JPRF has done a good job restoring traditional trails?
- 5) People see the JPRF as a place that supports culturally-based recreational activities, such as building canoes, walking on trails, and storytelling. How could you tell if the JPRF is successfully providing recreational opportunities?
- 6) Some people want to see the JPRF provide opportunities for traditional social activities, such as gathering and celebration. How would you check to see if JPRF was successful in providing opportunities for social activities?

Theme D: Tl'azt'en Ways of Teaching and Learning Measures of Cultural Revitalization on the JPRF

Interview Questions

From our previous interviews, we learned about how JPRF programs and activities should be delivered. Interview participants emphasized using Tl'azt'en ways of teaching and learning. This interview is intended to develop Tl'azt'en measures of this value. Your answers will help us understand how you think the JPRF should be assessed in terms of achieving a Tl'azt'en vision of good forest co-management.

- 1) Many people want the JPRF to provide education through hands-on learning. How would you determine if the JPRF is successful in using hands-on learning?
- 2) We also learned that people would like the JPRF to provide education through mentorship opportunities. How would you evaluate the success of the JPRF in providing mentorship opportunities?
- 3) Several people would like to see the JPRF provide opportunities for work-related education. How would you evaluate the JPRF's performance in providing work-related learning experiences?
- 4) We heard through our interviews that people would like the JPRF to provide outdoor education programs. How do you know if the JPRF has done a good job of providing outdoor education opportunities?
- 5) People told us that the JPRF needs to involve Tl'azt'en community members and Elders as educators. How would you determine if JPRF programs have been successful in achieving this goal?
- 6) People see the JPRF as a place that strengthens relationships between generations, such as connecting youth and Elders. How would you evaluation the success of the JPRF in strengthening these types of connections through programs and activities?

Focus Group Outline

November 15th, 9:00-1:00 (including lunch)
Elders' Center, Tache
16 participants invited, 5-11 expected

Agenda and Schedule	
8:45	Welcome and coffee
9:15	Project introduction
9:50	Indicator A, prioritize
10:50	Break
11:00	Discuss B and C
11:30	Evaluation
12:00	Lunch

Detailed Plan

Before the workshop/focus group

- Distribute agenda outline and interview findings [Done – Nov 9th]

Welcome

- Coffee, snacks

Introduction (20 minutes)

- Introductions
- Video consent agreement
- Explanations –
 - no wrong answers
 - why I'm recording, verbal video consent, explain that previous consent form is being used
 - going to be very structured to get through as much material as possible in a short period of time.
 - Everyone is equal in this room - interested from hearing from each of you
 - It's ok not to agree on everything – I want to hear different points of view, there are no wrong answers
- Begin Powerpoint

Beginning of Discussion - Slide 14 (15 minutes)

- Measures Guidelines (post on the wall) – recommend mine, ask if anyone wants to add some, or take some away, we'll revisit after each indicator
 - Makes sense to community members
 - Reflects community values
 - Is linked to the JPRF
 - Measures the indicator and the criterion
 - Will show change over time
 - Is specific enough to measure(Add new ones with a different color pen)
- Information sources – discuss list (primary and secondary sources), post
- Explain why Cultural Revitalization was selected as the case
 - Very important to have Tl'azt'en input
 - UNBC interviews indicated that they would like Tl'azt'enne to set the standards
 - Easier than working with the spatial data – good place to start

Begin with Indicator A (45 min - 1 hour, plus a 15 minute break)

- General overview of the indicator and the comments, review themes, interrelationships [add traditional knowledge]
- Work on developing measures questions for each of the measures themes (one at a time) – *possibly ask for proposed measures*. Use follow-up questions from guidelines sheet on the wall. Think of possible answers to the question, and see if that's the type of information that they want.
- Use focus group techniques, pay attention to who is contributing, make everyone feel included
- Question people if they start to seem too prescriptive, and ask if that measure could be relevant in the future as well, as the JPRF grows and evolves
- Have literature examples on hand if people are stuck
- Post the final sheets on the wall, count the number of measures, and distribute a number of stickers (1/3 – 1/5 of the number of measures) for voting. This will be used to sort the measures in order of priority for the group
- Revisit the Guidelines

Discuss Indicators B and C (30 minutes)

- For the remaining indicators, I will try to apply your guidelines, style and comments, and then ask you to comment on and prioritize them via mail or email. I will also ask some questions about if that is a good method.
- Discuss results of interviews and add information

Evaluation Discussion (30 minutes)

Method Evaluation Interview Guide (end of Focus Group)

1. What was your overall impression of this session?
2. Are there any recommendations you would give to improve the explanation of measures (introduction)? Did the exercises help you understand the process?
3. Were you satisfied with how the interview comments were integrated with the exercise? How would you improve the integration of interview data?
4. Would you be interested in using measures
5. Was the focus group approach suitable for creating measures? How would you improve the measures creation process?
6. Did you feel that your ideas and perspectives were sufficiently considered and integrated?
7. Was the group size appropriate? What are your recommendations?
8. Was the group composition appropriate? Who do you think should be included in a process such as this?
9. Was the length of this session appropriate? Would you make it longer or shorter?
10. Was the pace of this session appropriate? Were you satisfied with what was accomplished at this session?
11. How did you feel about voting on the measures as a way to prioritize?
12. Is the setting appropriate (Elders' Center)?

Thanks to participants!

Appendix 2: JPRF Measures of Success for Cultural Revitalization

Description of Variables

TYPE – as determined by the structure of the measure, from its description

QUAN – Quantitative

QUAL – Qualitative

QUAN/QUAL – Both quantitative and qualitative (Two measures in one)

OPIN – Opinion-based measures, which are both qualitative and quantitative

P/A – Presence/Absence measure, which is quantitative

SOURCE – refers to the origin of each measure

INT 03 – Expected JPRF outcomes interviews conducted prior to the present study (2003-2004)

INT05 – Measures interviews conducted by the author (spring/summer 2005)

FG – Measures focus group conducted by the author (fall 2005).

SQ – Measures added by analyst based on identification of obvious gaps within the draft measures set, based on TI'azt'en information only (not literature)

RELIABILITY – an estimate based on the measure source and the data type

HIGH – Quantitative measures that are objective (not opinion-based)

MOD – Qualitative measures and opinion-based measures that assess opinions of those who have a low potential for biased responses

FOCUS – as determined by the structure of the measure, from its description

JPRF – assesses the condition or management of the John Prince Research Forest
and associated programs

TN – assesses conditions of the Tl'azt'en Nation communities or Tl'azt'enne

UNBC – assesses the conditions or processes of the University of Northern
British Columbia

COMM – examine the conditions in surrounding communities outside the co-
management partnership that are specified in the measure description;
used to assess impact of co-management

EFFORT – based a rough estimate by the author of the time needed to evaluate each
measure

LOW – less than 30 minutes, requiring 'in-house' data collection including record
keeping

MOD – more than 30 minutes, and less than eight hours, requiring data collection
activities outside the JPRF office with individuals or small groups (e.g.,
keyoh holders or co-management board), or requires fairly intensive in-
house efforts for more than 30 minutes, including record keeping

HIGH – would require a multi-day data collection initiative, including a survey of
many individuals, archival/document analysis, detailed record keeping,
and/or complex survey questions a small number of individuals

VALIDITY – an assessment by the author of closeness of the linkage between the measure and the value being measured (i.e., the value expressed in the interviews and focus group)

HIGH – there is a clear and direct linkage between the measure and the value

MOD – there is a weaker but logical linkage between the measure and the value, used to assess difficult to measure values (e.g., the measure assesses the presence of a policy, the presence of important information, or demonstrates awareness or knowledge that is necessary to protect/support a given value)

Theme 1: Using Dakelh language and place names

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
<i>Recommended Measures</i>								
01	Satisfaction of Tl'az'en JPRF staff about JPRF's use of Dakelh	Should be generally satisfied; should have mainly positive comments and few to no negative comments	OPIN	INT05	JPRF	Low	High	Mod
02	Number and/or Percentage of JPRF staff who speak basic Dakelh	Increasing percentage until 100%; Differentiate by employment types (e.g., full-/part-time, year-round/seasonal, continuing/temporary); can be self-assessment	QUAN	INT05 FG	JPRF	Low	High	High
03	Number and/or percentage of JPRF staff who speak Dakelh fluently	Increasing percentage until 100%; differentiate by employment types (e.g., full-/part-time, year-round/seasonal, continuing/temporary); can be self-assessment	QUAN	INT05 FG	JPRF	Low	High	High
04	Number and/or percentage of maps and signs produced by JPRF that are bilingual or primarily use Dakelh, by type	Increasing until 100%; must be original maps	QUAN	INT05 FG INT03	JPRF	Low	High	High

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
05	Number and/or percentage of maps and signs produced by JPRF that are partially bilingual	Is a secondary measure; if fully bilingual maps and signs cannot be achieved; increasing number/percentage, but should eventually decrease as fully bilingual increases; must be original maps; should define partially bilingual (e.g., 10-49% place names in Dakelh)	QUAN	INT05 FG INT03	JPRF	Low	High	High
06	Percentage of JPRF events where Dakelh was used	Increasing percentage until 100%; should include examples of how it is used, e.g., opening prayer	QUAN	INT05	JPRF	Low	High	High
07	Percentage of JPRF organizations with Dakelh names	Increasing percentage until 100%; should include list of names	QUAN	INT05 FG	JPRF	Low	High	High

Theme 2: Revitalization of traditional roles and governance systems

#	Measure	Preliminary Evaluation	Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
<i>Recommended Measures</i>									
08	Satisfaction of <i>keyoh</i> holders on JPRF's approach to consultation and information sharing	Should be generally satisfied; should have mainly positive comments and few to no negative comments		OPIN	INT05	JPRF	Mod	High	Mod
09	Satisfaction of <i>keyoh</i> holders with JPRF land-based projects	Should be generally satisfied; should have mainly positive comments and few to no negative comments; e.g., timber harvesting, trail building		OPIN	INT05	JPRF	Mod	High	Mod
10	Satisfaction of Tl'azt'en BOD members and <i>keyoh</i> holders with how <i>keyoh</i> holders are acknowledged by JPRF	Should be generally satisfied; should have mainly positive comments and few to no negative comments		OPIN	INT05	JPRF	Mod	High	Mod
11	Satisfaction of Tl'azt'en JPRF BOD with how JPRF has worked with Elders	Should be culturally appropriate; should be generally satisfied; should have mainly positive comments and few to no negative comments		OPIN	FG	JPRF	Mod	High	Mod
12	Satisfaction of Tl'azt'en JPRF BOD with methods used to involve <i>keyoh</i> holders in JPRF co-management	Should be generally satisfied; should have generally positive comments and few to no negative comments		OPIN	FG	JPRF	Mod	High	Mod

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
13	Satisfaction of Tl'azt'en JPRF staff with its opportunities to incorporate culture into the workplace	Should discuss how they have been able to do this; should be generally satisfied; should have mainly positive comments and few to no negative comments	OPIN	INT05	JPRF	Low	High	Mod
14	Presence of a mutually agreed-upon JPRF policy for sharing benefits with <i>keyoh</i> holders	Policy should exist; should find evidence that policy is in use	P/A	INT05	JPRF	Low	Mod	High
15	Presence of JPRF policy stating that <i>keyoh</i> holders get first employment offers	Policy should exist; should find evidence that policy is in use	P/A	INT05	JPRF	Low	Mod	High
16	Presence of maps in JPRF office delineating <i>keyohs</i> , with <i>keyoh</i> holders labeled	Presence; should be visible or easily accessible; shows acknowledgement of <i>keyoh</i> holders	P/A	INT05	JPRF	Low	High	High
17	Description of how JPRF distinguishes between trap lines and <i>keyohs</i>	It may be necessary to distinguish between official trap line holders and traditional <i>keyoh</i> holders. These needs may shift as cultural revitalization progresses. Initiative should come from <i>keyoh</i> holders; JPRF should be responsive to community on this issue	QUAL	FG	JPRF	Low	High	Mod

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
18	Description of how JPRF has worked with Elders	Should be consistent, culturally appropriate, meaningful, engage Elders in area of expertise; e.g., a list of Tl'azt'en Elders and their area of expertise or an active Elders Advisory Committee	QUAL	INT05 FG	JPRF	Mod	High	Mod
19	Description of methods used by JPRF to involve <i>keyoh</i> holders and their families	Should be on the land, tailor methods to specific needs, meaningful involvement of all <i>keyoh</i> holders and their families (and potentially their clans); involved in projects from beginning; include how issues are resolved; use a diversity of approaches	QUAL	INT05 FG	JPRF	Mod	High	Mod
<i>Potential Measures</i>								
20	Satisfaction of Tl'azt'en BOD with land stewardship opportunities on the JPRF	Should be generally satisfied; should have generally positive comments and few to no negative comments	OPIN	SQ	JPRF	High	High	Mod
21	Presence of a JPRF policy to encourage gifts to be given to acknowledge contributions where appropriate (as in <i>balhats</i>)	Policy should exist; giving gifts is the traditional way of showing thanks; however this is not always appropriate	P/A	INT05	JPRF	Low	Mod	High

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
22	Ability of JPRF staff to describe traditional governance systems	E.g., <i>balhats</i> , <i>keyoh</i> , and clan system; could be assessed by Elders or Tl'azt'en BOD; indicates cultural knowledge of staff; differentiate by employment types (e.g., full-/part-time, year-round/seasonal, continuing/temporary)	QUAL	FG	JPRF	Mod	Mod	Mod
23	Description of how JPRF supports Tl'azt'en governance restoration efforts	Should be in response to needs expressed by community; broad-based support; take advantage of opportunities and JPRF expertise	QUAL	INT05	JPRF	Mod	High	Mod

Theme 3: Providing opportunities for cultural revitalization activities

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
<i>Recommended Measures</i>								
24	Satisfaction of Tl'azt'en BOD with JPRF cultural opportunities	Should be generally satisfied; should have generally positive comments and few to no negative comments	OPIN	INT05 INT03	JPRF	Mod	High	Mod
25	Description of how JPRF supports cultural eco-tourism for Tl'azt'enne	Should not maximize number of projects, but quality of projects; focus on long-term growth/consistency; appropriate for stage of development; culturally-appropriate; long-term economic and social benefits to Tl'azt'enne	QUAL	INT05	JPRF	Low	High	Mod
26	Description of how JPRF supports Tl'azt'enne in practicing traditional land use activities	Should be cost-effective, take advantage of opportunities and expertise, target a wide range of Tl'azt'enne, be effective in getting people out on the land, be long-term/consistent	QUAL	INT05	JPRF	Low	High	Mod
27	List of JPRF facilities and supplies for cultural activities	Increasing diversity of activities for all age groups (particularly Elders, children and youth), locally unique or rare facilities, responsive to community needs; e.g., cabins, trails, smokehouse, interpretive signs, canoes	QUAL	INT05 INT03	JPRF	Low	High	Mod
28	Amount of JPRF support for Tl'azt'en Nation's cultural initiatives	Increasing amount; e.g., direct financial support, dollars raised through grants, and in-kind contributions	QUAN	INT05 FG	JPRF	Low	High	High

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
29	Length of restored traditional trails on the JPRF	Increasing length	QUAN	INT05	JPRF	Low	High	High
30	Number of Tl'azt'enne who have visited JPRF (Cinnabar) for camping, by age group	Increasing number; e.g., age groups - children, youth, adults, Elders	QUAN	INT05 INT03	JPRF	Mod	High	High
31	Number and description of opportunities for Tl'azt'enne to participate in JPRF activities and projects of cultural importance	Increasing number; should engage many different Tl'azt'enne, particularly Elders, children and youth; focus on JPRF strengths/mandate, maximize program quality, seasonal opportunities; consistent or expanding opportunities; e.g., place names, trail restoration	QUAN, QUAL	INT05 FG INT03	JPRF	Low	High	High/Mod
32	Number and list of community cultural functions that JPRF staff has participated in, by type of function	Diversity of functions, functions with high cultural importance	QUAN, QUAL	FG	JPRF	Low	High	High/Mod
33	Number and list of external cultural events held on the JPRF	Increasing number, diversity of events, e.g., women's healing camps	QUAN, QUAL	INT03	JPRF	Low	High	High/Mod

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
<i>Potential Measures</i>								
34	Level of interest of Tl'azt'enne about JPRF cultural programs	Should be generally interested; should have mainly positive comments and few to no negative comments; could also assess excitement and enthusiasm	OPIN	INT05	JPRF	High	High	Mod
35	Satisfaction of JPRF trail building crew with traditional trail restoration projects	Should be generally satisfied; should have generally positive comments and few to no negative comments	OPIN	INT05	JPRF	Mod	Mod	Mod

Theme 4: Using research to revitalization traditional culture

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
<i>Recommended Measures</i>								
36	Presence of a policy that requires all JPRF documentation of Elders' knowledge to be shared with Tl'azt'en Nation	Policy should exist; should find evidence that policy is in use; e.g., must follow Tl'azt'en Nation Research Protocol	P/A	INT05	JPRF	Low	Mod	High
37	Description of how JPRF research has benefited cultural revitalization for Tl'azt'en Nation	Should maximize impact on cultural revitalization (not # of benefits); contribute to appropriate stages of revitalization (e.g., inventory, research for early stages); align with current community needs; support community-driven initiatives	QUAL	FG INT03	JPRF	Mod	High	Mod
38	Amount of money raised or provided by JPRF for research on traditional Tl'azt'en culture	Increasing amount; include in-kind support	QUAN	INT05	JPRF	Mod	Mod	High
39	Number of Elders' stories that have been documented by JPRF research	Increasing number; may include research that is funded by proposals written by JPRF, or proposals that JPRF supported through letters; measurement unit could also be number of projects	QUAN	INT05 FG	JPRF	Mod	High	High

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
40	Percentage of JPRF projects where original recordings, transcriptions and/or reports are provided to Tl'azt'en Nation	Increasing percentage until 100%; may want to split up measure for recordings, transcripts and reports	QUAN	INT05	JPRF	Mod	High	High
41	Number and description of JPRF research projects on topics of cultural importance	Increasing number; should be high-quality, large in scope, intensive, many projects, topics of high-priority in the community; examples are: land use, plants, traditional food, burial sites, archeology, place names	QUAN, QUAL	INT05 INT03	JPRF	Low	High	High/Mod
42	Number and description of JPRF research projects that include recording and documentation of Dakelh language	Increasing number; should be high-quality, large scale/scope of projects, large volume of recording/documentation; e.g., place names	QUAN, QUAL	INT05	JPRF	Low	High	High/Mod
43	Number and description of reports on Tl'azt'en culture, history, and/or people produced by JPRF research	Increasing number; should be high-quality, large scale/scope of projects, large volume of reports; examples are: land use, plants, traditional food, burial sites, archeology, place names	QUAN, QUAL	INT05 INT03	JPRF	Low	High	High/Mod

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
<i>Potential Measures</i>								
44	Satisfaction of participants with JPRF research projects on traditional culture, by project	Should be generally satisfied; should have generally positive comments and few to no negative comments	OPIN	INT05	JPRF	High	High	Mod
45	Percentage of Elders' stories documented by JPRF that are attributed to an Elder	Increasing percentage until 100%; (i.e., not anonymous)	QUAN	INT05	JPRF	High	High	High

Theme 5: Using education to revitalize traditional culture

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
<i>Recommended Measures</i>								
46	Number of schools involved in JPRF programs on traditional culture	Increasing number	QUAN	INT05	JPRF	Low	High	High
47	Number of students involved in JPRF programs on traditional culture, by age group	Increasing number; age groups may include children, youth, adults, Elders	QUAN	INT05	JPRF	Mod	High	High
48	Amount and description of JPRF curriculum and materials on traditional culture, by topic	Increasing amount; should cover a range of topics: Dakeh language and place names, Tl'az'ten history, traditional knowledge and values, traditional land use and cultural activities, and hands-on and outdoor learning; multi-media materials; must be based	QUAN, QUAL	INT05 FG INT03	JPRF	Mod	High	High/Mod
49	Number and description of cultural skills delivered to participants through JPRF programs	Increasing number; should deliver a diversity of skills, skills that are high priority for Tl'az'tenne (if known); e.g., hunting, trapping, fishing, gathering medicine plants, healing, gathering food plants, gathering plants for materials, food processing	QUAN, QUAL	INT05	JPRF	Low	High	High/Mod

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
50	Number and description of JPRF learning opportunities on traditional culture, by type	Increasing amount; should cover range of topics: Dakeh language and place names, Tl'az't'en history, traditional knowledge and values, traditional land use and cultural activities, and hands-on and outdoor learning; should target at-risk youth/drop-outs;	QUAN, QUAL	INT05	JPRF	Mod	High	High/Mod
<i>Potential Measures</i>								
51	Awareness of Tl'az't'enne about JPRF education programs on traditional culture	Increasing awareness; e.g., assessed by survey	OPIN	INT05 FG	JPRF	High	High	Mod
52	Opinion of instructors and curriculum writers on the quality of JPRF programs on traditional culture, by program	Should be generally satisfied; should have generally positive comments and few to no negative comments; e.g., carefully planned, challenging	OPIN	INT05	JPRF	High	High	Mod
53	Satisfaction of instructors with skills attained by participants of JPRF programs on traditional culture, by program	Should be generally satisfied; should have generally positive comments and few to no negative comments	OPIN	INT05	JPRF	High	High	Mod
54	Satisfaction of participants with JPRF education programs on traditional culture, by program	Should be generally satisfied; should have generally positive comments and few to no negative comments	OPIN	INT05	JPRF	High	High	Mod

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
55	Number and description of traditional cultural skills successfully developed in participants through JPRF programs, by program	Increasing number; should develop a diversity of skills, skills that are high priority for Tl'azt'enne; e.g., hunting, trapping, fishing, gathering medicine plants, healing, gathering food plants, gathering plants for materials, food processing and storage	QUAN, QUAL	INT05	JPRF	High	High	High/Mod

Theme 6: Cultural revitalization results

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
<i>Recommended Measures</i>								
56	Number of groups from UNBC who hear Dakelh language spoken on Tl'azt'en traditional territory	Increasing number; alternative measure - number of students	QUAN	FG	UNBC	Low	Linked	High
57	Number and list of UNBC courses where students learn about Tl'azt'en Nation (e.g., culture, history, knowledge systems, etc.)	Increasing number; should be a diversity of courses (to reach more students)	QUAN, QUAL	FG	UNBC	Mod	High	High/Mod
58	Opinion of Tl'azt'en Staff, Tl'azt'en BOD, Chief and Council on how JPRF contributes to cultural identity, cultural pride, and intergenerational connections	Should be generally satisfied; should have generally positive comments and few to no negative comments	OPIN	INT03	JPRF	High	High	Mod
59	Opinion of Tl'azt'en youth about the importance of education on traditional culture and language	An increasing number of youth should feel that cultural education is important or very important; should have generally positive comments and few to no negative comments	OPIN	INT05	TN	High	High	Mod

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
60	Opinion of Tl'azt'enne on the level of cultural identity, cultural pride, and intergenerational connections in the community	Should be generally satisfied; should have generally positive comments and few to no negative comments	OPIN	FG INT03	TN	High	High	Mod
61	Satisfaction of Tl'azt'en BOD members with how Tl'azt'en culture is part of JPRF	Should be generally satisfied; should have generally positive comments and few to no negative comments; should give rationale for opinions; e.g., in board meetings, processes, facilities, organizational culture	OPIN	SQ	JPRF	Mod	High	Mod
62	Description of how local/regional schools deliver education regarding traditional governance systems	Increasing extent of delivery, accuracy and depth of information, range of students reached, non-traditional instruction	QUAL	INT05	COMM	High	High	Mod
63	Number of jobs in the community that require cultural skills	Increasing	QUAN	SQ	TN	Mod	High	High
64	Number of place names within Tl'azt'en territory that have been legally changed to Dakelh	Increasing until all names are changed	QUAN	FG	TN	Mod	High	High

#	Measure	Preliminary Evaluation Key	Type	Sources	Focus	Effort	Validity	Trustworthiness
65	Percent of Tl'azt'enne who have Dakelh language skills, by skill type and by age group	Increasing percentage until 100%; skill types may include: writing, reading, speaking, oral comprehension, translation, interpretation, place names, stories; Age groups may include: children, youth, adults, Elders	QUAN	FG	TN	High	High	High
66	Percent of Tl'azt'enne who have traditional use skills, by skill type	Skill types may include: hunting, trapping, fishing, gathering medicine plants, healing, gathering food plants, gathering plants for materials, food processing and storage, wood gathering, camping, tanning hides, making clothing, beading, basketry, canoe	QUAN	FG	TN	High	High	High
67	Ratio of employed Dakelh translators to total number of translators in Tl'azt'en Nation	Approaching 1:1 (all should be employed)	QUAN	FG	TN	Mod	High	High

Appendix 3: Quantitative analysis of the measures' characteristics by theme

Themes Analysis	Total # measures	Percent of measures	Implementation Level Recom'd Potential	Mixed Methods		Type	
				Qualitative	Quantitative	Objective	Subjective
1: Using Dakelh language and place names	7	10%	7	0	6	6	1
2: Revitalization of traditional roles and governance systems	16	24%	12	5	4	9	7
3: Providing opportunities for cultural revitalization activities	12	18%	10	3	3	9	3
4: Using research to revitalize Dakelh culture	10	15%	8	1	5	9	1
5: Using education to revitalize Dakelh culture	10	15%	5	0	2	6	4
6: Cultural revitalization outcomes	12	18%	2	1	6	8	4
Total	67	100%	44	10	26	47	20

Themes Analysis	Focus		Monitoring Effort			Reliability		Validity	
	Management	Community	High	Moderate	Low	High	Moderate	High	Moderate
1: Using Dakeh language and place names	7	0	0	0	7	7	0	7	0
2: Revitalization of traditional roles and governance systems	16	0	1	9	6	2	14	12	4
3: Providing opportunities for cultural revitalization activities	12	0	1	3	8	5	7	11	1
4: Using research to revitalize Dakeh culture	10	0	2	4	4	7	3	8	2
5: Using education to revitalize Dakeh culture	10	0	5	3	2	4	6	10	0
6: Cultural revitalization outcomes	2	10	6	5	1	7	5	12	0
<i>Total</i>	<i>57</i>	<i>10</i>	<i>15</i>	<i>24</i>	<i>28</i>	<i>32</i>	<i>35</i>	<i>60</i>	<i>7</i>

People see the JPRF as a place that strengthens relationships between generations, such as connecting youth and Elders. How would you evaluate the success of the JPRF in strengthening these types of connections through programs and activities?

Appendix 4: Copy of Band Council Resolution

TL'AZT'EN NATION

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CHIEF AND COUNCIL RESOLUTION

The council of the TL'AZT'EN NATION	Date of Duly Convened Meeting			
Ndiz un'a nets' animal: Do Hensby Resolve:	B.C.R. # 0711	DAY 18	MONTH 05	YEAR 2005

Whereas, the University of Northern British Columbia (UNBC) and Tl'azt'en Nation have jointly developed a successful research proposal through the Community-University Research Alliance (CURA) program of the Social Sciences and Humanities Research Council of Canada;

Whereas, the UNBC and Tl'azt'en Nation jointly manage the John Prince Research Forest through Chuzghun Resources Corporation;

Whereas, the proposed project will involve the employment of Tl'azt'en community members as participants, as well as providing technical and administrative support to the research;

Whereas, participation in this project will provide the Tl'azt'en community with an opportunity to build capacity and experience in developing equitable partnerships that may be beneficial in future land management of other parts of their traditional territories;

Whereas, research will be conducted according to guidelines and protocols established in the CURA Memorandum of Understanding developed jointly by Tl'azt'en Nation and UNBC Steering Committee members, as well as follow the Tl'azt'en Nation Guidelines for Research in Tl'azt'en Territory;

Be it hereby resolved that Tl'azt'en Nation Chief & Council fully support the project Aboriginal Social and Cultural Measures of Forest Co-Management Values, led by Sarah Parsons of the University of Northern British Columbia.

Quorum (1/3)

Councillor

Councillor

Chief

1/6/01 Councillor

Councillor

Councillor

☐ Attachments